The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XII. No. 312 JUNE 6, 1925 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0.

Contents

PAGE

EDITORIAL: New Sulphate Prices; Chemical Sheet Lead; A New Hydrogen Peroxide Process; Fire-Damp from Mine Timbers; Hunter Gray; Stream-line Filter of Gases; The British Association 547
Chemicals at the British Empire Exhibition 550
Annual Meeting of the Chemical Engineering Group 551
Reviews 552
Industrial Poisons and their Causes 554
CORRESPONDENCE: "Brunner, Mond and Co. and the Häusser Process" (C. J. Goodwin) 555
Chemical Matters in Parliament 558
From Week to Week 559
References to Current Literature 560
Patent Literature 561
Market Reports 564
Company News; New Chemical Trade Marks; Chemical Trade Inquiries; Tariff Changes 569
Commercial Intelligence: New Companies Registered 570

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices—8, Bouverie St., London, E.C.4.
Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines).

New Sulphate Prices

THE British Sulphate of Ammonia Federation announce that for delivery in the months of June, July and August the price of best neutral sulphate of ammonia for home consumption will be £12 5s. per ton, while £12 2s. 6d. is quoted for export for a quality slightly lower in nitrogen content. This shows a further easement, partly with the object of encouraging agriculture to use increased supplies of artificial fertiliser and partly owing to the steadily growing output. Almost simultaneously the German Nitrogen Syndicate announce their new scale of prices, which work out approximately at the following figures in sterling per 1,000 kilos, roughly equal to one ton:—Sulphate of ammonia, basis 20½ per cent. nitrogen, £9 11s. June, rising to £11 1s. February-May. Leunasalpeter, basis 27 per cent. nitrogen, £12 11s. June, rising to £14 11s. February-May. Cyanamide, basis 15 per cent. nitrogen, £6 5s. June, rising to £7 7s. February-May. Urea, basis 46 per cent. nitrogen, £25 9s. 6d. any position. Nitrate of soda, basis 16 per cent. nitrogen, £10 4s. any position. Nitrate of lime, basis 15½ per cent. nitrogen, £9 2s. any position. These are the prices for German home delivery, but in Holland the terms are:—Sulphate of ammonia £10 19s. June, rising to £12 7s. February-May. Leunasalpeter £14 10s. June, rising to £16 9s. February-May. Leunasalpeter, it may be recalled, is the commercial name for the combined salt, ammonium sulphate-nitrate, produced by the Haber-Bosch nitrogen fixation process, and manufactured on a large scale by the Badische concern at their Oppau and Leuna works. We learn from the United States that energetic measures are being taken to introduce it on the American market and to popularise its use in American agriculture.

Our remarks last week on the production of sulphate of ammonia in the pea crystal form by the Billingham synthetic process have attracted considerable attention. Although a sample of the crystalline sulphate has been on view at Wembley since the reopening of the Chemical Section, few visitors had realised the importance of this chemical achievement until it was called attention to in our columns. Some of the gas companies, as we have already pointed out, have also produced a fine quality of needle-crystal sulphate which is on view at Wembley, and we are told that the commercial demand for it is extremely good. Moreover, we are assured by a well-known gas chemist that, if experience shows the pea crystal form to be more suitable than the needle-crystal form, there will be no great difficulty in changing over from the needle to the pea crystal form. Our informant's view is that it is all a matter of supervision during the crystallisation stage of manufacture, and that the larger gas concerns should be able to effect the change without much difficulty, though the smaller ones may find their resources scarcely equal to it. It is a point on which the views of gas chemists would be of great interest.

Chemical Sheet Lead

THE price of chemical sheet lead has been gradually increasing for some time, until it has now reached the substantial figure of £45 per ton, a figure which is bound to cause many to hesitate before embarking on the erection of new plant or the renewal of old plant. Naturally, when the price reaches the zenith, the question of quality becomes relatively more important. Chemical sheet lead has never yet been clearly defined, and although tests have been applied to determine its suitability for certain specific purposes, it is known that these are not sufficiently infallible to admit of definite reliance being placed in them. Many chemical engineers are distinctly of the opinion that the quality of chemical sheet lead has not improved during the last two decades. Probably this is due to the fact that singularly little Pattisonian refined chemical sheet lead is produced. Chemical manufacturers may fondly imagine that they are being supplied with the Pattisonian quality, but inquiry would probably reveal that few, if any, works refining lead to-day are operating the last-named process. By far the largest quantity of chemical sheet lead is

being produced by the Parkes process. It may be as pure from an analytical point of view as the Pattisonian quality, but for some reason or other, in practice, we have been told that it does not answer so satisfactorily.

A good deal has been heard of the flash test as affording a measure of the suitabilty of chemical sheet lead for sulphuric acid purposes, but the flash test has not yet been clearly defined. The time factor is a very important one, as indeed is the precise strength and quality of the acid which is being used. If arsenical sulphuric acid of 96 per cent. strength is employed, the flash test will differ from that when non-arsenical sulphuric acid is used. But even the flash test is only indicative of the suitability of the lead for concentration purposes, and this represents a fast declining demand. Although it may be interesting to know the flash test when purchasing lead for sulphuric acid chambers, this certainly cannot be regarded as a reliable guide to the satisfactory character of the lead.

A determination of the loss in milligrams per square centimetre which a piece of lead undergoes when subjected to the actual conditions obtaining within the chambers constitutes a far more reliable guide than any flash test can be. But corrosion is not the only influence to which the lead is subjected. Physical defects may prove to be serious, yet the methods for determining the physical characteristics of chemical sheet lead are yet in their infancy. It is to be hoped that the committee of the British Engineering Standards Association, which is considering this question at the moment, will not only make a definite effort to standardise chemical tests which are likely to be a reliable guide to the suitability of chemical sheet lead, but will also direct their energies to the establishment of tests which will be of service in indicating an idea of its physical suitability.

A New Hydrogen Peroxide Process

THE recent announcement concerning a new process for the manufacture of hydrogen peroxide constitutes interesting reading, but whether it is of a novel character, calculated to revolutionise the manufacture, as has been suggested, or whether some important modification in one or more stages of the existing process has been introduced, it is impossible to say. No industry affords a better illustration of the need for an accurate knowledge of chemical engineering principles, and for a correct appreciation of chemical control, than the one concerned with the manufacture of hydrogen peroxide. The stages in the process of manufacture, interesting as they are, afford no clear idea of the elaboration and precision which are necessary, if anything approaching reasonable yields are to be obtained. The manufacture of hydrogen peroxide involves the reduction of barytes to barium sulphide, the conversion of the latter to barium carbonate, its decomposition to barium monoxide, which must subsequently be oxidised to barium peroxide. The last named is the basic product, and is sold to many of the straw bleachers for the production of hydrogen peroxide. The mode of preparation of the latter is to take barium peroxide (which must be pure and finely ground and made into a paste with water) and to introduce it very gradually into a solution of sulphuric acid under controlled temperature conditions. Afterwards, the liquid is decanted from the precipitate and purified. The precipitated barium sulphate recovered is sold as " blanc fixé."

An examination of the process, from a chemical engineering point of view, reveals that the conversion of barium sulphate to barium sulphide is an operation fraught with difficulties as regards high yields. It is true that barium sulphate, when treated with anthracite duff, does not fuse, as is the case with sodium sulphate when reduced to sodium sulphide. But the yield of barium sulphide is not too satisfactory. Whether a revolving furnace should be used, or fireclay retorts, each with a producer, is a moot point. The lithopone manufacturers prefer the latter, whereas it is believed that " revolvers " are favoured by the manufacturers of barium peroxide. Loss also arises in the lixiviation process. Again, sodium sulphide, which is a by-product, is obtained in a weak state of concentration, unless care is exercised in the washing of the barium carbonate. But possibly the greatest loss of all occurs in the reduction of the barium carbonate to barium oxide, and in the oxidation process. The yields cannot be high, and much labour is undoubtedly involved in washing out the unconverted oxide from the basic product, and in rendering this available as a marketable product.

The need for chemical control at all stages of the process is insistent. It is known that attention has been directed for several years now to an improvement of yields at the various stages of the process, and from the announcement recently made, it can safely be concluded that some of the inherent difficulties of the process have been overcome, and that its economic success has been consolidated. It is certain that an interesting tale could be told of problems encountered and difficulties surmounted, but, unfortunately, it is feared that these must for long remain undisclosed as trade secrets.

Fire-Damp from Mine Timbers

WE have lately received from Sir John Harrison, the Director of the Government Department of Science and Agriculture in British Guiana, an interesting account of an unusual and rather mysterious explosion which occurred in the workings of an old metalliferous mine on the Puruni river. The incident is one worth calling attention to, for it discloses a source of danger which would certainly not be suspected, and it should prove a useful warning and experience to those who may contemplate the reopening of temporarily abandoned mines of a similar character. The Government experts satisfied themselves that an accumulation of an explosive gas had collected in the old workings, but it was no easy matter to determine what might be the source of the gas. After careful consideration the only feasible explanation that could be offered for the origin of the explosive mixture was that it had resulted from the anærobic action of the water in the mine upon the timbers which had been employed for supporting the roof of the workings. In order to test the theory pieces of the wood were selected and submitted to the action of ordinary rain water in suitable gas-tight containers in the laboratory. Afte some time a considerable quantity of gas was found to have been evolved, and on analysis it proved to

be a mixture of approximately two volumes of methane and one volume of hydrogen. We do not recollect having come across any previous instance of the kind accounting for the presence of fire-damp, and even though the prospects of similar explosions occurring are remote we are indebted to Sir John Harrison for his account of quite an interesting curiosity.

Hunter Gray

IN the chemical industry, and especially among chemists interested in Patent law and practice, the news will be received with sincere regret of the death of Mr. J. Hunter Gray, K.C. It will come, too, as a great surprise, for Mr. Gray looked a typical example of physical and mental fitness, and, having reached at the age of 57 a position of eminence in the branch of the Bar in which he practised, seemed to have many years of active work still before him. Of late years Mr. Gray had been concerned in many chemical actions and inquiries. He first came into prominence as a junior to Lord Moulton in the litigation concerning incandescent gas mantles, and taking silk in 1918 he became one of the recognised leaders of the Chancery Bar. He took part in several Safeguarding Act inquiries concerning fine chemicals, and was counsel for the Crown in the recent claim by Dr. Levinstein and Professor Green respecting the invention of mustard gas, which was heard before the Commission on Awards to Inventors. His last appearance at a chemical gathering was at the annual dinner of the Chemical Society. Himself a science man, Mr. Gray's chief characteristic was his thoroughness. He mastered his cases conscientiously, and without being brilliant in style he could argue a case full of technicalities with great resource and with a constant sense of what really mattered. Courteous, equable, and patient in temperament, and a thoroughly sound lawyer and reasoner, he was a real help to the Bench and an advocate who could always be trusted to do justice to his case.

Stream Line Filter for Gases

THE stream line filter, about which a good deal was heard a few months ago, is not likely to be confined to the treatment of liquids alone. Its application, we learn, will be more extensive, and will embrace the removal of dust from gaseous media such as blast furnace, producer, and burner gases. Naturally, one or two problems have to be overcome, but indications are not wanting to show that if gas temperatures do not exceed 800° C., and the dewpoint is not reached, the paper packs, made of asbestos, will not suffer too severely. On the other hand, there is reason to believe that the efficiency of the filter can be maintained for a considerable time, and the removal of dust, after it has coagulated (as does actually occur when the finer particles have grown by the adherence of other particles), is peculiarly simple, the mere application of a vibratory force at a specific part of the apparatus being such as to cause almost complete dislodgment of the dust which has been collected. Our readers will be interested to hear of this new line of development which opens up unexpected possibilities.

The British Association

THIS year the British Association visits Southampton for the third time in its history. The previous visits were in 1846, when Sir Roderick Murchison was president, and in 1882, when Sir Charles Siemens presided. This year Professor Horace Lamb will succeed Sir David Bruce as president, and in the presidency of the Chemistry Section Sir Robert Robertson will be succeeded by Professor C. H. Desch, whose address will be on "The Chemistry of Solids." The meetings will begin on Wednesday, August 26, and conclude on Wednesday, September 2. The programme is not yet available, but we are given to understand that it covers as usual a wide field, and in addition to the regular sessions arrangements are being made for a series of public lectures to citizens and to children. The place of meeting for 1926 is Oxford, with the Prince of Wales as president.

Points from Our News Pages

The death of Mr. J. Hunter Gray (p. 549).
Further survey of chemical exhibits at Wembley (p. 550).
The annual meeting of the Chemical Engineering Group (p. 551).
Reviews of recent works of interest to the industry (p. 552/3).
"Industrial Poisons and their Causes" is the subject of a practical survey by Dr. V. E. Henderson of Toronto (p. 554).
A letter is published on "Brunner Mond and Häusser Process" (p. 555).
Chemical questions in the House of Commons (p. 558).
The London Market is quiet after the holiday, but export demands are slightly better (p. 565).
The Scottish Market is rather restricted for heavy chemicals and prices are generally unchanged (p. 568).

Books Received

THE CRYSTALLINE STATE.—The Romanes Lecture. By Sir William Henry Bragg. Oxford: The Clarendon Press. Pp. 31. 2s.

ABRIDGED SCIENTIFIC PUBLICATIONS FROM THE RESEARCH LABORATORIES OF THE EASTMAN KODAK COMPANY. Vol. VIII. Rochester, New York: Eastman Kodak Company. Pp. 155.

THE CONVERSION OF COAL INTO OILS. By Franz Fischer. Authorised English translation edited, with a Foreword and Notes, by R. Lessing. London: Ernest Benn, Ltd. Pp. 284. 36s.

ORGANIC SYNTHESES. Vol. IV. Oliver Kamm, Editor-in-Chief. London: Chapman and Hall, Ltd. New York: John Wiley and Sons, Inc. Pp. 89. 7s. 6d.

The Calendar

1925		
June 8	Society of Chemical Industry (London Section): Annual Meeting. 8.15 p.m., followed by Ordinary Meeting. "Colloidics of Petroleum." A. E. Dunstan, F. B. Thole and W. H. Thomas.	Burlington House, Piccadilly, London.
12	Royal Institution: "Faraday as a Chemist." Sir William Pope.	21, Albemarle Street, Piccadilly, London.
13	Mining Institute of Scotland: General Meeting. 3.30 p.m.	St. Margaret's Hall, St. Margaret's St., Dunfermline.
16	Royal Institution, Chemical Society, Society of Chemical Industry and the Association of British Chemical Manufacturers: Faraday Benzene Centenary. Reception of Delegates. 11 a.m.	Royal Institution, Albemarle Street, London.
	Banquet. 7 p.m.	Hall of the Goldsmiths' Company, Foster Lane, Cheapside, London.
17	Royal Microscopical Society: Annual Exhibition of Microscopic Pond Life. 7.30 p.m.	20, Hanover Square, London, W.1.

Chemicals at the British Empire Exhibition

Interesting Tour of Inspection

THE organisers of the Chemical Section at Wembley succeeded admirably in conveying the moral of the exhibition to a party of visitors who on Friday, May 29, were invited to make a tour of the section. The latter included many representatives of the daily press, and as a result of the explanations given them some really appreciative notices of the exhibits from the public point of view reached readers who would otherwise understand little of the purpose of the exhibition.

The guests were received in the Garden Club, and entertained to luncheon there. Mr. Woolcock presided, and with him were Sir Max Muspratt, Mr. Guyton Butler, Mr. E. V. Evans, Mr. Linstead, Mr. H. E. G. West, and Mr. H. Barrett (members of the executive committee), with Mr. Marlow and Miss Small. In an informal explanatory address Mr. WOOLCOCK stated that the chemical section this year has been arranged in a way differing somewhat from that adopted last year, when one of the main purposes was to show the high degree of technical development which the industry had reached in this country. It is now sought to illustrate how varied are the products of the chemical industry, how manifold are the uses which they serve in connection with British manufactures, and to give an idea of the degree to which they are designed for beauty as well as profit.

Sir MAX MUSPRATT, who also spoke, reminded the guests that chemistry was now advertising itself because it believed it had a message to the world. It was the war, and especially what Germany was able to do with the aid of her chemists, that made this country realise, in a popular way, the meaning and importance of chemical industry. There were very few great fundamental chemical ideas which had not been originally developed in this country, but we had been a little slow in showing what we were doing and what we could do further in the future. That exhibition was helping to show in a quiet but effective way where British chemical industry stood to-day. The war revealed a few weak points, and ever since they had been studying and working with a view to eliminating those weak points and gaining the confidence of the industries which chemistry served and of the public in general.

Artificial Silk Duties

An interesting topical note was struck by Sir Max in his allusion to the artificial silk duties. Owing to our climate, he said, natural silk did not interest them very much except as a luxury article, and he felt it could stand a little duty. When they reflected on the heavy burdens laid on industry, he thought it only fair that their womenfolk should carry some small portion of the burden. Artificial silk was a more difficult subject. It was one of the greatest grounds of pride of the chemical industry in this country that we had achieved such a great success in artificial silk, and when we talked about artificial silk it meant more than that. "It is opening up an entirely new vista of textiles, in which this country has been supreme, and if she maintains her supremacy in this she is again, as in the past, going to control the great neutral markets of the world in textiles," said Sir Max. Some of them had been preaching that for five years past, and the response of the textile industry had been very noticeable. We were still, through these artificial fibres, supreme in the textile world throughout the world in the neutral markets, and we stood very high in the competitive markets. That we wanted to maintain. For a short time, with reasonable drawbacks and considerations, they could carry a certain amount of Excise duty as a balm to the feelings of doctrinaire free trade. He believed that the artificial silk trade could stand the duty for a year or two as a part of a luxury tax, and suggested that this country should take a broad view, as it had always taken in the past. The chemical industry was going to see these industries through, and if the shoe really pinched then would be the time for the artificial fibre manufacturers and the chemical industry to get together and say, "The time has passed for these duties. The necessities of this country and the expansions of the world require that we be free from these duties."

Afterwards the guests went through the Chemical Section and examined the exhibits in detail. The principal stands have already been noticed in THE CHEMICAL AGE, and points of interest on them and in the Scientific Section were explained by Mr. Woolcock, Sir Max Muspratt, Mr. E. V. Evans, and others.

British Cyanides, Ltd.

The British Cyanides Co., Ltd., in conjunction with the Beetle Products Co., Ltd. (as already announced), are showing a new synthetic resin which they claim is the first synthetic resin ever exhibited to the public which is transparent, colourless, and odourless. This synthetic resin is made by the company from thiourea of their own manufacture and formaldehyde, and we understand that they have taken out provisional protection by patent for the process of manufacture.

The resin is claimed to have some remarkable properties. As a non-conductor of heat and electricity it appears to stand in a class by itself from tests made by potential customers in the electrical trade. The Beetle Products Co. has been formed to take over the syrup, and samples are shown of moulding powders manufactured at their works from this synthetic resin, and a few articles moulded from these moulding powders. It is not the intention of the company to make moulded articles themselves as their object is the sale of the moulding powders.

Apart from the electrical properties of this new resin, there appears to be a large opening for moulded articles made from it, as the colourless nature of the resin permits of any colour from white to black being incorporated in the moulding powders. The moulded articles are practically unbreakable and as the resin is odourless the articles made from it convey neither odour nor taste, even when boiling water is poured into them. The company claim that long before the Exhibition closes they will be able to show cups and saucers made from their moulding powders which equal china in appearance and are practically unbreakable. If this claim is fulfilled the future of this industry should be assured.

Gas Exhibit for Wembley

Movement, more than anything else, attracted the crowds last year at Wembley. It is safe to predict that the second edition of the Gas Exhibit, in the same Pavilion as before in the Palace of Industry, is destined to receive much attention.

Prominently displayed on the main gangway a motor manufacturing exhibit shows the important industrial uses of gas in that industry; while a similar space on the other side of the Pavilion entrance shows two gas engines—one of them of 150 horsepower and over nine feet high—continuously at work, and among other duties supplying the power to a gas wafer-baking oven from which will be produced no less than 100 tins of wafers daily.

Various other industrial appliances can be seen in operation and a working exhibit of pottery making with gas-fired furnaces, conducted by the disabled ex-service men of the Ashtead Pottery, is certain to fascinate many. Another interesting section shows the applications of gas in various hobbies such as woodwork, model making, metal work and amateur wireless.

With the addition of daylight cinemas illustrating the thousand and one domestic and industrial uses of gas, and cookery demonstrations and lectures, there is no fear of the live gas industry having an exhibit which lacks life.

Thomas Fell and Co., Ltd.

The main exhibits of this firm are sachets of Old English Pot Pourri and Lavender flowers put up in a great variety of artistic designs. The flowers used are gathered from old-fashioned English gardens and dried by a special process which retains their original colours and odours. The preparation of Pot Pourri, which was once a little known art, and usually confined to the still rooms of country mansions, has now become a large and growing industry since its introduction in commercial form by Thomas Fell and Co. This firm are in a position to export any quantity of Pot Pourri in bulk and will welcome any inquiries for home and colonial markets.

Annual Meeting of the Chemical Engineering Group

Another Year of Good Work and Continued Progress

THE annual general meeting of the Chemical Engineering Group of the Society of Chemical Industry was held at the Chemical Industry Club, London, on Friday, May 29. The meeting was preceded by an informal dinner, at which Mr. W. J. U. Woolcock (President of the Society of Chemical Industry) was present. Mr. C. S. Garland (Chairman of the Group) presided.

Mr. WOOLCOCK, responding to the toast of his health, which was proposed by the Chairman, congratulated the Group upon the growth of its membership, which meant an accretion to the membership of the Society of Chemical Industry. Every new member of the Group was a source of strength to the Society in two ways: First, it meant an increase numerically, and secondly, it was an increase in the number of really live men who wanted to do something in chemical industry.

Annual Report

Mr. H. TALBOT (hon. secretary), in his report to the annual general meeting, stated that the work of the Group had been carried on under some difficulty, but had resulted in very noteworthy success. The Committee were anticipating an even better year during 1925. The membership had shown a satisfactory increase, the numbers for the last four years being as follows:—1921, 401; 1922, 315; 1923, 386; 1924, 408. The increase from 1922 to 1924 was undoubtedly due in large measure to the system inaugurated two years ago of collecting the Group subscriptions along with the subscription to the parent Society. A series of meetings was held in London and the provinces during the year, at which some very important and interesting papers were read. All these meetings were well attended, and provoked interesting discussions. The Group also organised the "Chemistry and Physics" Section of the World Power Conference at Wembley, while the "Gas and Fuel" Section, which developed from the initial work of the Group Committee, was afterwards organised by the National Gas Council. The conference was a pronounced success in every way, and the records of its proceedings, now available, constituted an authoritative body of information on the subjects treated, never before available in any language.

The relations of the Group with the parent Society continued to be of a most cordial description. The Group was also working in close co-operation with the Institution of Chemical Engineers in matters affecting their joint interests, and maintained touch with other learned Societies and Institutions in this country and abroad. Reference was made to the death of Mr. A. C. Flint (assistant secretary), in January, 1924. The Committee had placed on record their high appreciation of Mr. Flint's services, and had unanimously voted a grant to his widow in recognition of all that he had done for the Group from its inception. The Committee suffered other losses of staff about the same time as Mr. Flint's death, and it would have been difficult, if not impossible, to have carried on but for the voluntary assistance rendered by Mrs Talbot (wife of the hon. secretary) during the interval. In consultation with the Institution of Chemical Engineers Mr. C. J. T. Mackie was appointed to the vacant post as joint officer of the two bodies, and reference was made to the satisfactory manner in which he had carried out his duties.

The work of the sub-committee dealing with the issue of Data Sheets had been delayed considerably during the year, first by the death of Mr. Flint, and secondly by the serious illness of the convener, Professor J. W. Hinchley, who had now recovered. As a result, no Data Sheets were issued during the year, but it was hoped to make up for this by increased issues during 1925-26.

After thanking the members for their support in the past year, the Committee stated its intention to continue its work on the lines hitherto successfully pursued, especially in developing joint meetings with other bodies. The heartiest co-operation of all members of the Group was solicited in contributing or securing suitable papers for presentation at the meetings.

Ideas and Work

The CHAIRMAN, dealing with the question of the presentation of papers, acknowledged the co-operation of the members in the past, and asked for their hearty co-operation in the future. If any members knew of interesting work which was being done and which needed publication, there was no better organisation to bring it to than the Chemical Engineering Group, and the Group could ensure that it was brought home to the right people. The Committee always made a practice of inviting manufacturers, whether members of the Group or the Society or not, when subjects of interest to them were being discussed. Next year the Group would shoulder the greatest responsibility it had yet had put upon it, in that, jointly with the London Section of the Society of Chemical Industry, it was to be responsible for the conduct of the annual meeting of the Society, in London. The Committee felt that they must make the London meeting the finest the Society had had since the inception of the Group. The Committee wanted ideas and offers of work, and, although they might not be able to accept all the ideas submitted to them, they would be glad to accept all offers of assistance.

On the proposition of Mr. W. J. Gee, seconded by Mr. F. H. Rogers, the report was unanimously adopted.

Finance

Mr. F. H. ROGERS (hon. treasurer) submitted the balance sheet and accounts for the year. The revenue and expenditure account showed an excess of expenditure over income for the year of £131 17s. 6d. Under the arrangement made with the parent Society two years ago with regard to finance, the Group had reckoned on a grant of at least £300 from the parent Society last year, but up to the present they had only had £150. The matter was under discussion, however, and he believed that a grant would be made sufficient to cover the deficiency. Every member would be notified in due course as to the settlement made. Membership had increased, and, in his opinion, the finances of the Group could be regarded as being in a very healthy condition. The grant which had been made by the Group to the widow of the late Mr. Flint was an abnormal expenditure, but the members would agree that that money was well spent.

On the motion of Captain C. J. Goodwin, seconded by Mr. W. H. Coleman, the accounts were adopted unanimously.

Officers for the Year

The Committee have elected the following officers for the year 1925-26:—Chairman, Mr. C. S. Garland; hon. treasurer, Mr. F. H. Rogers; hon. secretary, Mr. H. Talbot.

The following, on the motion of Professor J. W. Hinchley, seconded by Mr. L. J. Tungay, were elected to fill vacancies on the Committee of the Group:—Messrs. W. H. Barnes (Manchester), F. Bridge (London), T. W. Stainer-Hutchins (Middlewich), F. A. Green (London), S. S. Napper (London), J. Kewley (London) and Dr. E. W. Smith (London).

At the conclusion of the proceedings, votes of thanks were passed to the committee, the hon. secretary, the hon. treasurer, and the chairman.

Following the annual general meeting, a demonstration was given of the process followed in the marbling of the edges of books, by dipping the edges of the books into a layer of colour floating on a bath. The liquid in the bath was composed of carrageen moss boiled in water, and strained off, with formalin and borax as a preservative. Water colours were sprinkled from a brush on to the bath, and formed into patterns by combing. The water colours were treated with ox gall in order to make them spread, and at the demonstration the patterns formed on the bath were taken off on pieces of paper washed with alum solution, the paper being laid on the surface of the bath.

Court of Chemical Achievement

THE time during which applications for products or processes believed to be sufficiently noteworthy to be admitted to the Court of Achievement of the Tenth Exposition of Chemical Industries to be held September 28–October 3 at the Grand Central Palace, New York, has been extended to June. This extension has been granted because more time has been requested by the directors of research in the laboratories of industries, Government bureaux, and educational institutions to choose from their work special items for the consideration of the committee.

Reviews

INTRODUCTION TO ORGANIC RESEARCH. By Professor E. Emmet Reid. London: Constable and Co. Pp. 343. 24s.

This book, though of American origin, should prove valuable to any student of chemistry in this country, whether in the organic field or not. There are chapters on research in general, on the means and conditions under which different types of research may be carried out, and on the selection of a problem for investigation. The author quotes authorities to support his contention that it is better to solve the details of a small problem rather than tackle a subject which is too large to lead to any definite results within a reasonable time. This is a point of view which is perhaps debatable. A considerable section of the book is devoted to the question of publication, lists being given of the principal research journals in all countries, and emphasis being laid on the importance of research on the chosen subject among the research journals and patent literature before work is started in the laboratory. The latter part of the book, which contains some contributions by specialists, deals more particularly with research on organic compounds and processes, and contains valuable information for the organic research worker on many points, including the problem of chemical engineering, viz., the conversion of a process from the laboratory to the commercial scale. Hints are also given as to the preparation of reports for publication. A close study of the book by university students should do much to prevent that narrowness of outlook which is rather too common. W.-J.

THE MODERN SOAP AND DETERGENT INDUSTRY. Volume II. The Manufacture of Special Soaps and Detergent Compositions. By Geoffrey Martin. London: Crosby Lockwood and Son. P. 368. 36s.

In the present volume the author continues his account of the industry. It is planned on the same lines as Volume I, which was reviewed in this journal, April 5, 1924.

It is devoted to a study of the various special soaps including oilet and pharmaceutical preparations, the use of which is such a marked characteristic of present-day civilisation. In addition an account is given of special methods of soap preparation and of the laboratory examination of soaps.

The special soaps are divided into five groups: 1 Toilet soaps and preparations; 2 Pharmaceutical preparations; 3 Textile soaps; 4 Chipped, flaked, abrasive, and polishing soaps; 5 Soft soaps.

Five other sections deal with—Miscellaneous methods of saponification; Soap substitutes and fillers; Leather, boot, and furniture polishes; Chemical analysis of soap preparations; Statistics of the soap industry.

It will be seen that a very wide meaning is given to the term "detergents." The author has pursued his policy of giving an account of the numerous recipes and processes which are comparatively of minor importance, and of which information is somewhat difficult to obtain. He has accumulated an immense amount of data in connection with this very varied and interesting group of materials.

The section (No. 1) dealing with Toilet soaps, etc., is the longest in the book and gives an interesting account o the modern machinery which has been devised to deal with the enormous and exacting demands of the public for this class of goods presented in an attractive form.

The section on Textile soaps includes a concise account of the qualities of soap demanded for the treatment of the principal fibres, and in Section 5 an account of the machinery for the preparation and packing of powdered and flaked soaps is given, which is extremely valuable.

Under the heading "Miscellaneous Methods of Saponification" there is a short but well-documented discussion on the recent work on the oxidation of mineral oils, which will prove of value to chemists quite apart from the preparation of soap. A brief account of the use of hexalin and allied hydrogenated aromatics is also given.

In the section on Soap Analysis a brief description of the laboratory methods is given, including the estimation of many of the more unusual ingredients. Generally speaking, the methods given are good, though in one or two cases a more modern and expeditious procedure might have been given, *e.g.*, the use of sulphuric acid in the place of hydrochloric in the Twitchell method for the estimation of rosin (page 10) and the precipitation of the soap with calcium nitrate in the estimation of chloride instead of the somewhat unsatisfactory method of ignition. There are very full references to the original literature in the section, which will be appreciated by analysts.

The statistical survey (Section 10) which concludes the book, gives an elaborate analysis of the production and distribution of soaps throughout the world, not even forgetting "the one small factory in the Fiji Islands."

The whole book is characterised throughout by the author's enthusiasm in the search for buried information and his determination to omit nothing which may prove of interest and value. The language throughout is concise and the elaborate system of sections and sub-sections renders the search for any particular information remarkably easy. We shall look forward to the third, and concluding, volume with interest. Dr. Martin has certainly earned the gratitude of all those whose facilities for literary research are limited, but whose need for the results of it is great. T. H. B.

A STUDENT'S MANUAL OF ORGANIC CHEMICAL ANALYSIS, QUALITATIVE AND QUANTITATIVE. By Jocelyn Field Thorpe and Martha Annie Whiteley. London: Longmans, Green and Co. 1925. Pp. 250. 9s.

This book is intended primarily for the use of students in the Imperial College of Science and Technology. For twenty years work in the organic laboratories of the College has been guided and supervised by Dr. Martha Whiteley, one of the authors. Dr. J. F. Thorpe, Professor in the same College, has long been recognised as a leading authority on the subject of organic chemistry. After examination of the book no doubt can exist that it will rank very highly amongst books of its class and that its utility will extend far beyond the confines of the College. Evidence of the practical experience of the authors in conducting analyses and in the manipulation of apparatus is repeatedly found in the many valuable hints and warnings given in the book.

Commencing with a chapter on the detection of elements in organic compounds, the authors continue with chapters on the purification of organic compounds for analysis, the ultimate analysis of organic compounds, the reactions of the commoner organic compounds, the detection and estimation of radicles and the systematic examination of complex organic compounds. The Appendix consists of a description of methods for conducting an ultimate analysis of an organic compound by micro-analysis when the quantity of the substance available for analysis weighs from 5 to 15 milligrams only. This will be useful to research workers who have not been able to prepare a sufficient quantity of the substance to be examined to enable analysis to be made in the usual manner. H. F. H.

THE THEORY OF QUANTITATIVE ANALYSIS AND ITS PRACTICAL APPLICATION. By Henry Bassett, D.Sc., Ph.D. London: George Routledge and Sons, Ltd. 1925. Pp. 308. 15s. net.

This book contains much information which will be of value to the practising analyst. It is not merely a book for students, nor is it limited to discussions of theories only. No attempt, says the author, has been made to write a complete treatise on Quantitative Analysis, but rather to consider most of the physico-chemical principles at the basis of all analytical operations. Nevertheless, he describes the best methods of estimating a number of elements, particularly the common metals, and discusses probable sources of error and how such errors may be avoided. Even experienced analysts will find in the book much that will arrest attention in the discussions of methods commonly employed in laboratories. But it is by the young analyst, rather than by the older school of analysts, that the book will be valued. The author assumes that all who use the book will be familiar with the Ionic theory and have a working knowledge of the law of Mass Action, and proceeds to explain facts relating to analytical chemistry by theories at present commonly accepted as satisfactory. In Chapter VII. he discusses the significance of colloidal chemistry in quantitative analysis, and says that colloid phenomena play a more fundamental part in most

analytical operations than is generally realised. He further says that sufficient is now known about the colloids and their behaviour under different circumstances to give the chemist sure guidance through most of his analytical difficulties. Probably some analysts will think that this assertion is too optimistic. The book is written chiefly for advanced students and candidates for honours degrees, and may be recommended without hesitation. H. F. H.

COLLOID CHEMISTRY: An introduction, with some practical applications. By Jerome Alexander, M.Sc. London: Chapman and Hall, Ltd. 8vo., 208 pp. Price 9s. 6d. 1925, 2nd edition.

This is a really excellent little book, and admirably serves its purpose of describing in small compass and in non-technical language some of the more important general properties of colloids and practical applications of colloid chemistry. About 50 pages are devoted to general properties, and the remainder to applications. The latter constitute a vast field. In fact, we begin with astronomy, and the author takes us with astronomical speed through the stellar immensities in order to investigate the colloidal properties of cosmic dust, cometary tails, meteors, and nebulæ. This is a most interesting section; but we quickly come to earth again, and after discussing the colloidal aspects of geology, meteorology, ceramics, and finding the ubiquitous colloid in many unexpected places, we arrive at the section on Soaps—a melancholy declension from the star clusters. But we must confess to feeling, personally, more at home in soaps than in cometary tails, and the author clearly shows that there is much more even in soaps than is at first sight apparent; all the wonders and beauties of the solar system may indeed be found in these sol-curded-gels, or colloidal electrolytes. Besides having a lot to do with the weather—a heavy responsibility—with dyeing and flotation and filtration, photography, brewing, tanning, practical applications are to be found also in paper, rubber, ice cream, boiler scale, confectionery, mortar, plaster, and in many other things. C.

LOW TEMPERATURE DISTILLATION. By SYDNEY H. NORTH and J. B. GARBE. London: Sir Isaac Pitman and Sons, Ltd. Pp. 216. 15s.

This is a brightly written publication dealing with the subject of low temperature carbonisation more particularly from the point of view of the provision of a home oil supply by the utilisation of small coal and so-called refuse fuel, such as cannels, oil shales, lignite, and peat. Perhaps the best section of the book is that dealing with the Belgian briquetting industry, which is certainly an object lesson, of particular significance at the present moment, of the value of scientific methods as applied to the colliery industry in regard to the effective utilisation of inferior coals with consequent increase in revenue. The book is divided into 16 chapters and has 40 illustrations, whilst a considerable number of modern low temperature processes are either briefly described or referred to, especially the "Freeman," "Fusion Retort," "Hartman," "Lamplough-Harper," Low Temperature Carbonisation ("Coalite"), "Maclaurin," "Nielsen," "Plauson," "Salerni" and "Tozer" processes, although the "Pure Coal Briquette" and the "Richards Pringle" processes are not described at all, and little or no reference is made to the important American and German processes. However, a very considerable amount of useful information is given and the book is well printed and produced.

PRINCIPLES AND APPLICATIONS OF ELECTRO-CHEMISTRY. VOL. I.—PRINCIPLES. By H. JERMAIN CREIGHTON. London: Chapman and Hall, Ltd. (for Messrs. John Wiley and Sons, New York). Pp. 446. 20s.

This is the first volume of a publication under the above title by H. J. Creighton and Colin G. Fink, the latter author having in preparation the second volume dealing with the applications of electro-chemistry.

The new book is very welcome since we are badly in need of a detailed description of the important science of electro-chemistry, especially in the sense used by the authors of electro-metallurgy as well as electro-thermics. This first volume contains 22 chapters with an adequate index, covering the field allotted in an effective fashion with numerous tables, curves and illustrations. The introduction and the second chapter, dealing with Faraday's Laws of electrolysis, are excellent, whilst of particular interest are the sections dealing with the migration of ions, the relations between chemical structure and the dissociation constant, hydrolysis, the theory of neutralisation indicators and its application to volumetric analysis, and the electro-chemistry of gases.

Decidedly the publication will be an aquisition to the library of both the chemist and the electrician.

THE FOUNDATIONS OF COLLOID CHEMISTRY: A Selection of Early Papers Bearing on the Subject. Edited on behalf of the Colloids Committee of the British Association by Emil Hatschek. Ernest Benn, Ltd., London, 1925. Pp. 173. 18s.

The immense record of scientific achievement serves as a stepping-stone to further progress. Once this task is completed, the mass of literature sinks into comparative obscurity. However, there always remain works of outstanding merit which continue to stimulate creative minds. Such fundamental publications—as far as colloid chemistry is concerned—have been collected for the first time in this volume. It consists of reprints and verbatim translations of articles by Graham, Faraday, Carey Lea, Van Bemmelen, Muthmann, Sobrero, Selmi and Ascherson, the writings of the last two being rendered in English for the first time. The matter selected is that which most fully reproduces the quintessence of experiments and philosophy of these fathers of colloid chemistry. To those chemists who appreciate bright treatment of a difficult subject we recommend the articles by Graham and Faraday. There they will find highly scientific matter dealt with in a manner which affords delightful reading. The translations leave nothing to be desired. Each article or series is prefaced by a brief biography and accompanied by references to modern colloid chemical literature. The text is rounded off by useful indexes of subjects and names. Mr. Hatschek possesses exceptional qualifications for the task which he has so successfully accomplished. The book is beautifully printed, bound and got up in a manner worthy of the best traditions of English publishing. It should form an indispensable addition to the library of every chemist. S. P. S.

LES NOTIONS FONDAMENTALES D'ELEMENT CHIMIQUE ET D'ATOME. By Georges Urbain. Gauthier-Villars and Co. Paris, 1925. Pp. 172 and table. 10 francs.

This little volume gives a lucid and simple narrative of the new conceptions of the chemical elements and atomic weights based upon the discoveries of the Curies, Sir W. Ramsay, Sir W. Crookes, Sir J. J. Thomson, Aston, Soddy and others. It is a little too difficult for merely "educated people," but should form good reading for chemists and everybody seriously interested in chemistry. Study is facilitated and memory aided by the inclusion of some figures and experimental data. The book lacks an index—a defect not infrequent in French publications. Similarly, there are hardly any references. If these faults were eliminated an English translation would be popular in this country. S. P. S.

MARGARINE (in German). By Dr. Hans Franzen. Otto Spamer, Leipzig, 1925. Pp. 100. Unbound, 10 gold marks; bound, 12 gold marks.

This volume forms a German counterpart to W. Clayton's book on margarine. It is a businesslike illustrated statement of the history, raw materials, manufacture, properties and analysis of margarine. The necessary plant and analytical methods are dealt with efficiently, yet concisely; the chapters on Sterilisation, Vitamines and Emulsions are particularly useful. There are numerous references to English literature. The volume is well, though rather closely, printed; the copy before us is unbound. It forms a succinct treatise on a most important branch of organic chemical industry and should be read by everybody interested in this subject.

S. P. S.

Industrial Poisons and their Causes

A Survey by Dr. V. E. Henderson, of Toronto

DR. V. E. HENDERSON, Professor of Pharmacology, University of Toronto, recently addressed the members of the Toronto Section of the Society of Chemical Industry on the subject of "Industrial Poisoning."

In his opening remarks, Dr. Henderson referred to the work that was being carried on by the medical profession in regard to industrial diseases. The Ontario Medical Association had formed a Committee on Industrial Medicine. This Committee was charged with the duty of studying two related problems, namely, the occurrence of infectious disease in industry, and secondly, of intoxications from poisonous substances which arose in industry. This Committee was working in close conjunction with the Department of Industrial Medicine of the Provincial Board of Health of Ontario.

The first difficulty encountered by both these bodies in regard to industrial intoxications was the recognition of such intoxications. Dr. Henderson referred to the fact that many physicians would fail to regard such a condition, as the rash arising in candy makers, due to the action of the hot sugar solutions on the skin, as a cause of industrial intoxication. In this case the disease was one that was fairly well known to those that had been following this particular subject. On the other hand, new diseases were constantly appearing. One of these was "nickel rash," a peculiar type of skin disease occurring in workers handling nickel ores in refineries, and also amongst electroplaters. The exact mechanism by which this rash was produced was not known, nor had they direct indications for its treatment or prevention. Those problems were being studied by the Department of Industrial Medicine of the Province.

Industrial Intoxication

It was not at all easy to get accurate information at the present juncture in regard to the amount of industrial intoxication occurring amongst workers in Ontario, but that the situation was serious seemed to be revealed by some figures prepared by the Provincial Board of Health, in which it was shown that there were 147 cases with which the Department had come into contact during the last three years. Taking these cases alone and calculating per 100,000 of industrial employees in the province, the incidence of lead poisoning was higher than it was in Great Britain twenty-five years ago, when very drastic legislation was introduced to prevent this industrial hazard. When the speaker was a student, the diagnostic symptoms of lead poisoning as taught were such that the disease would only be recognised in the advanced stage when the workman would be incapacitated for a long period of time. Further study had now enabled a diagnosis to be made in a very early stage of the disease.

During the past three years the Provincial Board of Health had investigated, as well as those cases of lead poisoning, 102 cases of skin diseases arising from nickel, sugar, and cutting oils, etc.; 26 cases of poisoning from benzol, and it was known that more cases of this type of poisoning existed—indeed in one factory it was known that there were at least 14 cases suffering from mild benzol poisoning which were not included in the above; 22 cases of poisoning from turpentine and volatile solvents and dryers in painters and similar workers; 10 cases of mercury poisoning; 10 of silicosis, that is from certain dusts arising in mining and grinding; 10 cases of skin and respiratory disease (asthma) arising from certain dyestuffs and artificial silk; 5 cases of carbon tetrachloride poisoning; 5 from wood alcohol; and individual cases from at least 10 other sources.

Dr. Henderson pointed out that in Great Britain very great progress had been made, and this was largely due to the fact that the administration of the Factory Inspectors Act was largely controlled by competent specially trained physicians who had gradually developed into the world's greatest experts in industrial intoxications.

Under the Workmen's Compensation of Ontario, only a limited number of industrial intoxications could be compensated were the intoxication to arise in a chronic form. If, however, such intoxication arose by accident, compensation could be claimed. Chronic benzol poisoning was for a long time unrecognised as a clinical disease and the first cases arising in that province were long unrecognised. Now benzol poisoning in an early stage was very easily recognised, easier indeed than lead poisoning at a corresponding stage of the disease. The first essential to its proper diagnosis was a definite exposure to benzol fumes, even in low concentration. How low the concentration which was nontoxic was not known as yet. Certainly 0·015 c.c. of benzol vapour in a litre of air would cause acute benzol poisoning and rapid death. It was probable that twenty parts of the vapour in a million in air inhaled constantly would cause chronic poisoning. The patient showed lassitude, some weakness, poor appetite, and a white blood count of 5,000 and under instead of the normal 9,000 or 10,000.

Typical Cases of Poisoning

The speaker then referred to poisoning as it appeared to occur in various types of industry. Amongst painters Ontario was better than some parts, probably due to the fact that most paint was mixed with oil in the factories, there was less dry sandpapering and less lead was being used in inside paints, and also probably to the better conditions in which the painters lived. It was evident, however, that exposure to turpentine and other volatile solvents might lead to chronic disease. Mercury poisoning occurred amongst hat makers, but mercury formed an excellent illustration of a poison to which many persons became extremely susceptible. Dr. Henderson referred to one or two cases of which he had personal knowledge in whom frequent minor intoxications with mercury had led to such an extreme degree of sensitiveness that these persons were unable even to touch a globule of mercury with bare hands without showing some symptoms.

Amongst fur dyers cases of poisoning from ursol and other paraphenylendiamine derivatives occurred, and these patients, too, often became extremely susceptible, so much so that in one case a patient could not even enter a room in which furs dyed with this process were contained without having a severe attack of asthma. Other cases responded by showing skin rashes. Dr. Henderson referred to a lady who had recently had a fur collar dyed, and as a result of wearing it had a broad belt of rash about the neck and lower part of the face. She was naturally sensitive to this type of poisoning, while many others might wear that same collar without showing similar symptoms. Amongst those who worked with nitroglycerin a different phenomenon was often seen; workers who had at first been sensitive and showed decreased blood-pressure and fainting, gradually became resistant to its general effects, though they might still suffer from the ulcers which were produced locally on the tips of the fingers and under the finger nails.

Persons working with chromates in any form were liable if they inhaled the dust to show very typical ulceration which led to the perforation of the septum between the two halves of the nose, and there seemed to be evidence that a chronic absorption led to kidney disease. Bichromates were one hundred times as toxic as the oxides, and as chromates were frequently used as mordants, dyers were frequently affected.

Petroleum refiners and persons who came in contact with all the lighter fractions, benzine, petrol ether, were exposed to acute poisoning, a type of anæsthesia with some symptoms of convulsions which might lead to death. Amongst workers with higher fractions, the paraffins, there seemed a liability to the production of skin inflammations of a warty type, especially from certain oils, while others did not seem to possess this characteristic. In the rubber trade there were numerous hazards from the solvents, benzine, sulphur chloride, benzol, aniline if it was used as an extractive, lead, and frequently carbon disulphide, where again small quantities—1–1½ mgm. per litre—might produce chronic effects showing themselves in nervous diseases and brain affections.

Dangers from Coal Tar

The employment of coal tar was not without its dangers. It produced a tar eczema, warts, and cancers as did the oils used as lubricants with products from certain sources—for instance, Scottish shale oil.

Aniline in the form of aniline black used in dyeing shoes had given rise to cases of acute poisoning. Two girls, for instance, were poisoned by dyeing cloth shoes black and wearing them to a dance. Aniline workers suffered from a chronic poisoning in the form of bladder tumours.

In conclusion, Dr. Henderson said that chemists might be interested in the possibility of foretelling the poisons from their chemical composition, but showed that this was by no

means an easy matter. For instance, in the series formamide, acetamide and propionamide, etc., the toxicity decreased, the first two being marked convulsant poisons; while in the series, acetonitrile, propiononitrile, etc., the toxicity increased. The carbilamines were extremely toxic, the formula being CH_3NC, which suggested that prussic acid might possess the formula HNC. The introduction of chlorine led to an increase in toxicity and anæsthetic strength; methane was hardly anæsthetic; monochlormethane somewhat; methylene chloride more so; and chloroform a good anæsthetic although with definite toxicity. Carbon tetrachloride was much more toxic. Nitromethane and all that series were toxic as was nitrobenzene and especially the dinitrobenzenes which were extremely toxic, while nitrobenzoic acid was almost non-toxic. The high toxicity of tetraethyl lead would hardly have been suspected. In the quantities causing death it could hardly be either the ethyl or the lead, but the peculiar combination of these two.

Brunner Mond and Co. and the Häusser Process

To the Editor of THE CHEMICAL AGE.

SIR,—The report of the annual meeting of Brunner, Mond and Co. has deservedly received prominence in your valued journal, and there is universal gratification at the remarkable progress which has been made. It may be in the general interest to draw attention to what appears to be a misprint of Mr. Roscoe Brunner's statement that the Company's experts have come to the conclusion that no alternative process, whether Claude, *Häusser*, or Casale, offers any advantage over the Brunner-Mond process, developed on the basis of the original Haber process.

The *Häusser* process is not one for the manufacture of synthetic ammonia at all, and it is inconceivable that Brunner, Mond and Co. are not aware of this. Probably Mr. Brunner was referring to the Fauser process, although the Company's own report in the *Times* prints the same mistake.

The Häusser process, it may be recalled, is one for the production of nitric acid by the explosion of gases of reasonably high calorific value, and improvements in the technique and general application of this process have been made during the last few years, which indicate that at some future date it may be expected to become commercially practicable. Its rôle would be that of making nitric acid or supplying nitrous gases in cases where nitrate of soda is at present used or where the acid is made by the oxidation of ammonia, synthetic or other. To use synthetic ammonia for making such nitric acid seems illogical, should it prove advantageous to make the acid direct and without the loss which occurs during its manufacture from ammonia. Moreover, the Häusser process can be worked in relatively small units, the capital cost is lower, and the net power consumption is nil.

I would add that, as far as I am aware, Brunner, Mond and Co. have not seriously examined the possibilities of the Häusser process in its present development, because the production of nitric acid is not of immediate interest to them. Mr. H. A. Humphrey, a director of Synthetic Ammonia and Nitrates, Ltd., was responsible for a brilliant theoretical investigation of the Häusser process during the war, and rightly concluded that, at that time, it was not ready for development. The position is now different, and I feel sure you will agree that it is in the general interest that the apparent misstatement in regard to the Häusser process should be contradicted.—Yours, etc.,

C. J. GOODWIN.

7-8, Idol Lane, Eastcheap, E.C.3.
June 2.

[We have communicated with Brunner, Mond and Co. as to the passage our correspondent refers to and are officially informed that the exact terms of Mr. Roscoe Brunner's statement are as follows: "Finally, our experts have examined all the other processes for making synthetic ammonia or nitric acid, and we have come to the definite conclusion that none of them, whether Claude, Häusser, or Casale, can offer any advantages over our own." This, of course, disposes of our correspondent's suggestion that "Häusser" may have been a misprint for "Fauser" (the author of yet another synthetic process in Italy).—ED. *C.A.*]

Notes on Indian Chemical Research

(FROM OUR INDIAN CORRESPONDENT.)

FURTHER observations on the conditions under which fixation of nitrogen by non-symbiotic organisms takes place, have shown at Pusa that bonemeal gives higher fixation figures than the mineral phosphates, and that nitrogen fixation is increased by the addition of rotted organic matter to the soil, but that this increase is not obtained if excess of organic nitrogen is used, apparently owing to loss of nitrogen due to ammoniacal fermentation. As compared with cattle manure, fermented rice straw has been found to give larger yields both of maize and of oats grown as a second crop. Sugarcane trash added to the soil does not appreciably increase the rate of nitrogen fixation, but does so if previously treated with a bacterial inoculum in the form of a water extract of cow manure. Rice dust as an organic manure is liable to very rapid ammoniacal fermentation with consequent nitrogen loss, so that as a promoter of nitrogen fixation allowance must be made for such loss and ammoniacal fermentation reduced by proper attention to water supply.

Organic Manures

The influence of the moisture content during the rainy season on the ammonifying and nitrifying power of black cotton soil is being investigated at Nagpur. The results indicate that a moisture content of 24 to 30 per cent. enables the soil to attain its maximum biological activity as regards nitrification, and that with the temperature fluctuating between 75 and 95° F. during the monsoon months, 50 to 60 per cent. of added nitrogen in the form of oil-free sesamum cake is oxidised in two weeks.

The decomposition of different cake manures under field conditions in the red soils of Bengal is being studied at Dacca. With a moisture content kept more or less constant between 14 and 16 per cent., the nitrification of castor and mustard cake was progressive for the first two months, at the end of which it was 50 per cent. It then slowed down, and after four months amounted to 56 and 55 per cent. respectively. Sesamum, saf-flower and groundnut cakes gave progressive figures of 58, 69 and 76 per cent. respectively.

The nitrification of bone manures, which is ordinarily a very slow process in most Indian soils, was the subject of investigation at Pusa. It was found that rapid and complete nitrification of this refractory material could be obtained by fermenting it before applying it to the soil.

Phosphates

The method under trial at Pusa of making mineral phosphates available by natural bacterial processes was extended to bonemeal. A composition of bone dust, sulphur and sand inoculated with a mixed culture of sulphur-oxidising bacteria was found to contain citrate-soluble phosphoric acid to the extent of 94 per cent. of its original content after a period of 23 weeks' fermentation. It was found that an excess of sulphur as compared with phosphate (as bonemeal) in the compost was preferable to the reverse; thus, by the gradual addition of bonemeal to the compost better results were got than by the gradual addition of sulphur, the total relative final amounts remaining the same.

Sewage Sludge

Experimental work in connection with the installation of an activated sludge plant for sewage disposal at Jamshedpur has shown that this system of disposal is suitable both from the sanitary and the agricultural points of view. It produces a clear non-putrefactive effluent and a sludge rich in nitrogen and free from any offensive odour. The sludge has been used effectively for irrigating an area of poor gravelly (*moorum*) land. It is hoped that full advantage of these results will be taken by municipalities which are satisfied with their septic tanks and filter installations.

S. G. W.

Meat and Bone By-Products Standardisation

AN investigation towards the establishment of standards in respect of meat and bone by-products has been carried out by the Canadian Department of Agriculture through the Chemistry Division. The results are published in the official bulletin No. 49, new series, and deal in detail with all classes of these fertilisers, giving analyses of their composition and data concerning specific brands and manufactures.

British Sulphate of Ammonia

Reduced Price for Summer Months

In a circular announcing that the price of sulphate of ammonia for home agricultural use for June, July, and August delivery will be £12 5s. per ton for neutral quality in fine friable condition, free from lumps, basis 21·1 per cent. nitrogen, the British Sulphate of Ammonia Federation state:

"Neutral sulphate of ammonia at our reduced price of £12 5s. per ton is again by far the cheapest and best nitrogenous fertiliser on the market, the unit value of nitrogen being about 11s. 7d., whereas the unit value of nitrate of soda at £12 5s. per ton is about 15s. 10d. When the price of nitrate is £12 per ton at British ports, sulphate of ammonia is worth well over £17 per ton delivered. To get an exact comparison of price with nitrate of soda, you multiply the price of sulphate of ammonia by 15·5 and divide by 21·1. Thus, when sulphate costs £12 5s., nitrate should not cost more than £9 per ton. A rough comparison may be made by multiplying the price of sulphate by 5 and dividing by 7, or by multiplying the price of nitrate by 7 and dividing by 5. Thus if you are asked to pay £12 per ton for nitrate and you can get sulphate for £12 5s. you can see at a glance that the price of nitrate is about £3 per ton too high.

"You will observe that in spite of the heavy reduction in price which we have decided to make, although there has been no material decrease in the price of our chief raw material sulphuric acid, nor in our other costs of production, we have made no alteration in the amount of the commission allowed to recognised distributors. We have refrained from reducing the commission because we are anxious not to do anything which might hamper the distribution and therefore discourage the use of sulphate of ammonia at a time when agriculture is but slowly recovering from an acute crisis and while British consumption of fertilisers generally is still far below the level already reached by progressive agricultural communities in other countries.

"As no ordinary quality is likely to be available for the months named we refrain from quoting a price for this quality. Prices for later months will be announced later, but we are prepared to quote for forward delivery now on application."

New Chemical Process Patent

Mr. Justice Romer in the Chancery Division on Thursday, May 28, heard an application by Synthetic Products Co., Ltd., who are defendants to an action by the Commercial Solvents Corporation, Ltd., for alleged infringement of the latter's patent for a process for manufacturing acetone and butyl alcohol. Defendants asked that the case should not come on before next November.

Mr. Whitehead, K.C., supporting the application, said the plaintiffs' specification set out a process for the development of bacilli cultures, and the defendants alleged that the process was insufficient. They retained an eminent bacteriologist to try to work it out, but a fortnight ago he committed suicide. Other bacteriologists would be engaged, but it would take about six months to complete their experiments.

The application was opposed, and it was alleged that the plaintiffs stole the invention from the defendants' predecessors in title, and that the defendants were using this very process before the date of the patent.

His lordship said if when the case came on he found that the defendants were prejudiced by the death of their bacteriologist he would grant an adjournment.

Lever Brothers, Ltd., and a Swedish Company

Lever Bros., Ltd., of Port Sunlight, appeared for fifteen days before Mr. Justice Russell in the Chancery Division as defendants in two actions brought by Swedish plaintiffs in connection with a contract for the taking over of the shares in a Swedish soap and perfume manufacturing company. His lordship on Wednesday, April 29, reserved his judgment (see The Chemical Age, May 2, 1925).

His lordship on Thursday, May 28, delivered his reserved judgment, dismissing both actions with costs. In the case of the Wallenberg action he held that the contract was illegal according to Swedish law. The defence of Lever Bros. as to misrepresentation failed, however, and on that issue the plaintiff would have his costs. With regard to the bank's action his lordship held that the guarantee relied on was a conditional guarantee and never became an absolute one.

Research Chemist's Discharge

On Friday, May 29, in the London Bankruptcy Court, an application was made to Mr. Registrar Francke for the discharge of John Thomas Norman, who was reported by the Official Receiver to have been investigating, in December, 1917, a deposit of potash in the Forest of Dean, when he discovered a product, locally known as "smut," which he found to be valuable in the extraction of solvents in connection with the manufacture of war munitions.

The debtor was adjudged a bankrupt in January, 1922, and he made the above statement with regard to a disputed claim for £2,375, returned as due to Mr. Rhodes and Mr. Cooper for alleged breach of agreement in connection with the acquisition of leases in the district of the Forest of Dean. In April, 1918, a syndicate called the Forest Syndicate (Ltd.) was formed to acquire the leases of those "smut" areas. In December, 1918, because he differed from the proposed policy regarding the use of the "smut," he therefore declined to put any money into the venture, and his association with the syndicate ceased without his having received any shares or remuneration for his discovery.

The Official Receiver added that the debtor had been engaged as a research chemist for the past 30 years, latterly at 23, Leadenhall Street, City. He was fairly successful until the outbreak of the war, but his business afterwards declined, with the result that his income was insufficient to meet his household and personal expenditure. He attributed his insolvency to that cause and admitted he had, since 1914, been more or less financially embarrassed. Although the debtor estimated his ranking liabilities at £1,313, the Official Receiver said that in his opinion the unsecured indebtedness amounted to £2,103. The assets had realised £94, and a first and final dividend of 3½d. in the £ had been paid.

The Official Receiver opposed the application on certain statutory grounds, alleging, among other things, that the debtor had contributed to his bankruptcy by rash and hazardous speculation.

His Honour granted the debtor his immediate discharge subject to payment of a judgment of £5.

Institute of Physics Annual Meeting

At the annual general meeting of the Institute of Physics on May 25, Sir William Bragg was elected president in the place of Sir Charles Parsons. Major C. E. S. Phillips was elected to succeed Sir Robert Hadfield as treasurer. The remaining offices were filled as follows: Past-Presidents, Sir R. T. Glazebrook, Sir J. J. Thomson, Sir Charles Parsons. Vice-Presidents: Professor C. L. Fortescue, Dr. E. H. Rayner, Sir Napier Shaw, Mr. R. S. Whipple. Hon. Secretary, Professor A. W. Porter. The annual report gives the total membership as 515.

There is stated to be unlimited scope for further applications of physics in the arts, industries and public services, and therefore for the increased employment of high-qualified physicists, and there has been a fair demand for young honours graduates in physics with two or three years' research experience. Seven lectures have so far been given in the series on "Physics in Industry," and they have been published in three volumes by the Oxford University Press. The Institute has recently established a benevolent fund. Much of the report is devoted to the *Journal of Scientific Instruments*, the second volume of which is now appearing. Action has been taken in conjunction with the Institute of Chemistry in urging upon the Board of Trade the desirability of defining the qualifications that should be required of Gas Examiners appointed by local authorities under the provisions of the Gas Regulation Act, 1920. A deputation from the two institutes waited upon the Board of Trade, and in reply it was stated that the changes in the method of appointment of gas examiners suggested by the deputation indicated the necessity for further statutory powers.

A local committee has now been constituted in Australia and Professor A. D. Ross, of the University of Western Australia, has been appointed local honorary secretary.

Chile Nitrate Production Increase

During the first two months of this year the production and exports of nitrate of soda amounted to 4,011,555 quintals and 5,393,948 quintals as compared with 3,848,086 quintals and 5,013,724 quintals in the corresponding period of 1924.

The British Association of Chemists

Trades Unionism

THE Association is registered as a trades union, but this does not imply that it is in any way committed to the trades union policy. But since registration as a limited company or as a trades union was necessary upon formal grounds of convenience, the latter policy was adopted.

The matter, however, raises an important question, since it invites inquiry as to how nearly a professional organisation ought to approximate in function to that of a trades union, and what essential distinction, if there be any, must be drawn between trades unionism and that which we will describe, for want of a better term, as protection.

The trades union is concerned only with employees, and therefore, rightly or wrongly, its concern must be with wages and labour to the exclusion of almost every other consideration. In the case of a professional organisation, however, the same conditions are not reproduced, since such a body to be representative must include all with a recognised right to practice, and not all these are in the same category, that of employees. At the very outset, therefore, it is obvious that with professional organisations in general, and with the Association in particular, trades union principles cannot be applied without considerable modification.

In the case of a professional organisation, protection means protection of the employer no less than of the employee. It has been the aim of the Association, in its attempt to organise the profession, not only to obtain for all professional chemists adequate remuneration, but to ensure, by this very means, that certain standard of ability and integrity that all employers have a right to demand. It cannot be made too clear that the Association exists not only to benefit the employee chemist, and to extend to him that protection of which he has stood in such dire need, but also to protect in its widest sense the chemical industry of this country. The Association is the avowed enemy of injustice in either employer or employed, and it exists to maintain and to defend the just demands of both.

But however this may be, it remains true that any protective organisation must, at least in some informal sense, retain the characteristics of a trades union. The economic question is a matter which must always remain in the first rank of importance, and it is one with which the Association is very intimately concerned. It is aware of, and views with great disfavour, the unsatisfactory conditions under which some chemists are compelled to carry out their duties. Such conditions—happily less common than formerly—are from every point of view most deplorable, since inadequate remuneration and status for the chemist not only produce duties unsatisfactorily performed with attendant dissatisfaction to all concerned, but they bring the profession of chemistry into contempt. This is particularly unfortunate at a time when it is above all things necessary to attract the very best intellects to the profession. Unsatisfactory economic conditions will force upon the profession a standard of mediocre intelligence at a time when our most vital industrial interests depend upon efficient and well-organised scientific service.

The British Association of Chemists is not, therefore, in any formal sense a trades union, and it is not tolerant of many of those principles upon which the modern policy of the trades union rests. Sufficient has been said to indicate that organisation upon such lines, even if it were desirable, is, from the very nature of the circumstances, impossible, and we would submit this consideration to the attention of those who are of opinion that a more definite trend in direction is desirable. Economic matters are indeed ofthe first importance, but any attempt to obtain satisfaction in this respect by acceptance of a trades union policy whole and entire would be attended with the most unfortunate consequences. Standard rates of payment, for example, a necessary part of the policy of any trades union, would be for the chemist an unalloyed evil. Adequate remuneration is a matter upon which the Association is always prepared to insist, but opinion is on the whole in favour of the view that this must vary with circumstances, and that insistence upon such questions as the minimum wage is a policy fraught with considerable peril to the interests of the profession.

It should be possible, therefore, to combine within the Association all shades of opinion upon this important matter, and the executive appeals to all chemists to assist its work in every possible way.

■ All inquiries concerning the Association should be addressed to the General Secretary, the British Association of Chemists, "Empire House," 175, Piccadilly, W.1. H. T. F. R.

Industrial Alcohol Production

A BULLETIN containing a review of the sources from which industrial alcohol is obtainable has just been issued from the Royal Botanic Gardens at Kew. It supplements a similar paper, published in 1912, since when the importance of alcohol as a commercial article has increased.

During the war, a mixture of alcohol and ether, itself made from alcohol, was used as the promoting solvent in the manufacture of cordite, and alcohol was also used in the production of mustard gas. The British Empire is almost entirely dependent on imported petrol, and the production of alcohol as an alternative or supplementary motor fuel has engaged the attention of the Department of Scientific and Industrial Research, and through it of the Dominions, Colonies, and Protectorates.

Dealing with sources of alcohol among fruits, the Bulletin states that in Queensland and New South Wales the acreage of "prickly pear lands" is calculated in millions on an increasing scale. For profitable distillation, the fruits should be conveniently obtainable, in quantities of at least 10 tons to an acre, capable of producing about 110 gallons of spirit. Experiments show that 1,000 kilos of coffee pulp will yield 127 litres of alcohol, and 100 kilos of acorns of common oak, durmast oak, and evergreen oak have yielded from 8·58 to 20·16 litres. Experiments at the Royal Naval Cordite Factory, at Wareham, resulted in good yields of alcohol from artichokes, and cultivation was recommended in order to supply a limited quantity of alcohol for special purposes in combination with the production of cellulose. It was realised, however, that the cost of cultivation on a field scale, and the restricted areas available, would prevent any large quantities being produced.

An extension of the intensive cultivation of the sweet potato is advised in South Africa, where there are large tracts of suitable land, a possible yield being six to seven tons or more to an acre, affording 35 gallons of 95 per cent. alcohol to the ton. The Bulletin refers to the magnitude of the production of alcohol from molasses. It states that in general a ton of sugar will yield 40 gallons of molasses, from which 16 gallons of alcohol of the first quality can be produced, though an average production from cane molasses may reach 69 gallons of 95 per cent. alcohol for a ton. Among forest products, the distillation of woods for the production of methyl alcohol is well established, and of growing importance. The total alcohol yield from western larch was at least 33 gallons to a ton of dry wood, which was almost 10 gallons a ton more than the yield obtained from any other wood.

Professor G. T. Morgan's Successor

AT a meeting of the Council of Birmingham University on Wednesday, Mr. Walter Norman Haworth was appointed Professor of Chemistry and Director of the Department of Chemistry in the place of Professor G. T. Morgan, recently appointed director of the new National Chemical Research Laboratory at Teddington.

Professor Haworth, who is Professor of Organic Chemistry in the University of Durham (Armstrong College, Newcastle-on-Tyne), was born at Chorley in 1883 and graduated B.Sc. with first class honours in chemistry at the University of Manchester, where he received the degree of D.Sc. in 1911. In 1910 he graduated Ph.D. (magne cum lande) at the University of Gottingen. After holding a demonstratorship in chemistry at the Imperial College of Science and Technology, South Kensington, he was appointed lecturer and subsequently reader in chemistry to the University of St. Andrew's, and became Professor of Organic Chemistry in Armstrong College in 1920, and Director of the Chemistry Department in 1921. His published work includes some 30 contributions to the Journal of the Chemical Society and other scientific papers.

The Casale Process in Japan

A JAPANESE company at present operating four Casale units has now ordered four additional units. The present production capacity is 30 tons per day.

Oil from Coal at Birmingham

English Coals and the Bergius Process

PROFESSOR A. W. NASH, of the Department of Oil Engineering and Refining, Birmingham University, has given details of research in oil from coal production to a *Birmingham Post* representative.

The method of operation consists in heating powdered coal at temperatures and under very high pressures with hydrogen gas, the pressures employed being of the order of 1,500 to 3,000 lb. per sq. in. The discovery was made about twelve years ago by the German chemist, Dr. Bergius, who has since investigated the process from both scientific and commercial points of view. Until operations were commenced at Birmingham University three years ago, only German coals had been experimented with, but the researches since carried out have shown that English coals can quite readily be converted substantially into liquid. The latter, however, differs from ordinary crude petroleum in that it contains relatively small proportions of substances not occurring in crude oil. When these are removed the residual liquid consists entirely of hydrocarbons, the basis of all fuel oils.

Up to the present, several different types of English coals have been investigated, and the results are encouraging. A South Staffordshire coal, on hydrogenation, gave 37 per cent. of liquid, a South Wales coal 26 per cent., and a Lancashire coal 61 per cent. These figures give respectively 80·56 and 130 gallons of liquid per ton of dry ash-less coal. The liquid products so far obtained have not yet been examined in detail, but Dr. Bergius claims that he can completely liquefy a suitable coal and obtain from it 30 per cent. of petrol, 30 per cent. of Diesel oil, 30 per cent. of heavy fuel oil, and 10 per cent. of valuable gas. Coal can also be partly liquefied by the method of low temperature carbonisation, but the highest yield of tar so far claimed by this method is 35 gallons per ton of coal, the claim being made in a recent invention. Consequently it will be seen at once, says Professor Nash, that the Bergius process is much more efficient in producing oil from coal, but it must be remembered that low temperature carbonisation gives in addition a valuable smokeless fuel.

Not yet a Commercial Proposition

The researches so far carried out at Birmingham have not been concerned with the commercial aspect of hydrogenation for the expense of such an investigation would be prohibitive. Dr. Bergius himself, in collaboration with a large staff of experts at Mannheim, has not yet succeeded in liquefying coal on a commercial scale in over 12 years' research.

It is the opinion of many British chemists and engineers however, that the problems should now be tackled in this country, although the many serious technical and mechanical difficulties must not be overlooked. Amongst these might be mentioned the difficulty of constructing large plant capable of withstanding an internal pressure of from one to two tons per square inch, the problems connected with leakages under such enormous pressure, the heating of the plant, control of temperatures, and the supply of hydrogen. All these were important factors which must be given very careful consideration before any considerable sums of money were spent in inaugurating a new industry.

Indian Magnesium Chloride Duty

Adverse Report by Tariff Board

THE Indian Tariff Board, in its report on the proposed duty for the protection of the magnesium chloride industry, announces its conclusion that protection would not be justified; first, because it has not been proved that the industry would eventually be able to maintain itself, and, secondly, because nothing less than a 70 per cent. duty would give the industry a fair chance of protection. Such a duty, the Board says, would involve the country in heavy sacrifice without any compensating advantage, the industry not being of national importance. Further, if supplies should happen at any time to be cut off, owing to an outbreak of war, the industry could be restarted at short notice. The report adds that the capital invested in the industry is small, and has already been twice repaid by previous profits.

Lord Leverhulme's Will

THE following is a short summary of the will of the late Lord Leverhulme.

The testator appointed his son, the present Viscount Leverhulme, and Mr. H. R. Greenhalgh, Mr. F. D'Arcy Cooper, and Mr. John McDowell to be his executors and trustees, and after giving each of them a pecuniary legacy he gave all the remainder of his property, real and personal, to his son, absolutely, except that out of the holding of the issued Ordinary share capital of Lever Brothers, Ltd., of which the testator was entitled to dispose, he set aside and appropriated one-half (viz., 120,000 shares of £10 each) of the total number of the fully-paid ordinary shares of that company to be retained by the trustees as a special fund for the purposes defined by the will.

These purposes were, in the first place, to pay certain legacies and annuities to persons in his personal employment at the date of his death or to whom he had been accustomed to make pecuniary allowances, and, subject to these payments, the income of the special fund is directed to be divided into 100 parts, of which: 10 parts are to be paid to the Viscount Leverhulme for the time being; 30 parts are to be divided amongst the chairman and other members of the special committee of the board of Lever Brothers, Ltd.; 20 parts are to be divided amongst the directors of Lever Brothers, Ltd., and the chairman of associated companies in various proportions; 20 parts are to be applied for the purposes of artistic encouragement; and the remaining 20 parts for charities connected with commercial travellers, grocers, or chemists, their wives, widows, and children.

The capital of the fund will be distributed immediately before the expiration of twenty-one years from the death of the survivor of the testator's executors and descendants and the descendants living at the testator's death of the late Queen Victoria in the following manner: 10 per cent. to the Viscount Leverhulme for the time being; 30 per cent. for the employees benefit fund of Lever Brothers, Ltd.; 20 per cent. for the staff training college of Lever Brothers, Ltd.; 20 per cent. for the purposes of artistic encouragement; 20 per cent. for charities connected with commercial travellers, grocers, or chemists, their wives, widows, and children.

The testator directed that the estate duty on the special fund should be paid out of the income of that fund, and consequently no distribution of income under the trust is likely for some time.

Sea Power Used for Lifting 160 Ton Gates

THE task of removing and repairing six giant lock gates weighing 160 tons each has just been successfully completed by the London Midland and Scottish Railway at Grangemouth Docks. These great gates, which control the entrance to the Docks from the sea, measure 47 ft. 6 in. by 35 ft., and in thickness vary from 2 ft. to 6 ft. 6 in. They were removed, repaired and replaced without interfering with the ordinary working of the docks. For the initial task of removal the power of the sea itself was used by the engineers. The gates, which are hollow and are filled with water to give weight to them, were emptied and made watertight. The rising tide then floated them off their bearings. They were taken in tow and placed in a graving dock. After being cleaned and repaired they were towed back to the locks, placed over the bearings at high tide, and with the ebb they sank slowly to rest.

Knowles Electrolytic Plant for the Pyrenees

WHAT is probably the largest contract of this kind ever placed has been signed by the Société des Phosphates Tunisiens of Paris with the International Electrolytic Plant Co., Ltd., of Chester. It is for an installation of 600 standard Knowles cells, each having a capacity of 7,500 amperes. The contract price is £63,300. The installation will produce by electrolysis of water over 70,000 cubic feet of hydrogen and 35,000 cubic feet of oxygen per hour. The hydrogen is for the newly formed Société des Engrais Azotes et Composes, whose present capital of 76,000,000 francs is held by the Société des Phosphate Tunisiens of Paris and the Norsk Hydro-Elektrisk Kvaelstofaktieselskab of Oslo. The works are at Soulom in the French Pyrenees, near Lourdes. The whole of the hydrogen will be used in the manufacture of synthetic ammonia.

Fruit Contamination by Copper Sulphate and Arsenic

AT the meeting of the Camberwell Borough Council, on Wednesday, the Public Health Committee reported that they had considered the following report submitted by the Medical Officer of Health with reference to the contamination of apples by copper sulphate and arsenic :—

"Whilst passing a stall in the Borough recently, my attention was drawn to the fact that on nearly every one of the apples exposed for sale there was a blue powder. I purchased several of the apples, and submitted them to the Analyst for a report as to the nature of this powder. The Analyst reports :—'From the first apples submitted I was able to remove 0·001 gramme of blue powder, i.e., 1 milligramme. The second delivery of apples did not yield any weighable amount. This powder was found to consist of copper (calculated as crystallised sulphate of copper) 0·140 milligrammes, arsenious oxide 0·015 milligrammes, calcium salts, etc., 0·845 milligramme. On so small an amount of material you will readily understand that a more complete analysis was impossible. The powder is obviously the result of spraying with Bordeaux Mixture (sulphate of copper and lime), which contains a small proportion of arsenic. This gives rise to a basic sulphate of copper, insoluble in water. The powder did not dissolve to any extent even in boiling water, but was easily soluble in dilute hydrochloric acid. Speaking as a chemist, I should say that the amount of copper and arsenic is of no significance.'

"It is true that the amounts of copper sulphate and arsenic present are small (copper sulphate 1/100 grain per lb., and arsenic 1/1000 grain per lb.), yet it must be remembered that apples are frequently eaten by children without cleansing. I understand that the apples were imported, but unfortunately it has not yet been possible to ascertain the country of origin, the apples having passed through several hands. It would seem desirable that where fruit has been sprayed with an insecticide, as in this case, steps should be taken to secure the removal of any deposit arising therefrom before the apples are packed. I suggest that the particulars be forwarded to the Ministry of Health."

The Public Health Committee recommended that a copy of the report of the Medical Officer of Health be forwarded to the Ministry of Health.

The recommendation was unanimously agreed to by the Council.

Poison Gas and the Public

SURGEON-COMMANDER G. R. MCCOWEN, in an address on "Chemical Warfare and the Medical Officer of Health," at the meeting of the Royal Institute of Public Health at Brighton on Friday, May 29, said that chemical warfare had established itself as a vastly important part of the means of destruction, and under the extreme conditions of a struggle between nations neither conventions nor the fear of the world's opinion would prevent its use as much as possible. In future wars the fighting forces would enjoy a high degree of protection against gases, and thus an enemy might not be willing to waste his chemical agents against protected and highly trained troops, but would employ them against the less protected and less disciplined civilian. It would appear, indeed, that the fighting forces would by no means bear the direct brunt of the war, but would be rendered powerless when their arsenals, dockyards, munition works, manufacturing towns, and the seat of government had been drenched with mustard gas.

During the last war mustard gas killed one man for every forty men it put out of action, whereas shells killed one for every three. In other words, gas was thirteen times as humane as bullets and high explosives, though it was essentially the weapon of demoralisation, and as it could terrorise without necessarily killing, it was the one that could enforce economically the policy of one nation on another. The speaker went on to describe the problems which thus confronted medical officers of health, and he insisted that if the public were not to become an easy prey to an effective weapon like mustard gas, the damage done by which was not always immediately effective, or even apparent, peace-time education and organisation was obviously of extreme importance. The public must be taught the rudiments of chemical warfare.

Chemical Matters in Parliament

Methylated Spirits Licence Duty

Commander Bellairs (House of Commons, May 27) asked the Chancellor of the Exchequer the estimated revenue obtained by the 10s. Licence Duty on sellers of methylated spirits; whether, in view of the need for more revenue and the increased use of the spirit for potable purposes, the Treasury had inquired into a duty on the spirits sold; and if he could state what was the present consumption?

Mr. Guinness said that the yield of duty from methylated spirit retailers' licences for the year ended March 31, 1925, was £9,682, and the quantity of mineralised methylated spirits sent out by makers in Great Britain and Northern Ireland during the same period was 1,388,448 bulk gallons. A duty on methylated spirits did not form part of the Chancellor of the Exchequer's Budget proposals.

Alleged Water Pollution

AT the Assize Courts, Manchester, on Thursday, May 28, the trial was resumed of the action brought by Thomas Murdoch, trading as Walton and Murdoch, bleachers and finishers, at Medlock Vale Bleachworks, near Clayton Bridge, for an injunction restraining the Clayton Aniline Co., Ltd., colour manufacturers, at Clayton, from depositing refuse in such a manner as to pollute the water of the Lumb Brook from which the plaintiff's works derive their supply of water. (see THE CHEMICAL AGE, May 30.) The plaintiff complained that water coming from the defendants' tip contained colouring matter which found its way to the works and stained the cloth.

The day was devoted to taking the evidence in chief of Mr. Percy Bean, a Manchester analytical and consulting chemist, who stated that he had made a special study of bleaching, finishing, sizing, and kindred subjects. He produced a large number of samples of water taken on various dates at the tip, from the streams which formed the Lumb Brook, from the canal between Manchester and Ashton, the overflow of which finds its way into the Lumb Brook, and at the plaintiff's works. Pieces of stained cloth were also produced. The witness ascribed these stains to the water from the tip. This water, he said, contained colouring matter which, being in solution, could not be removed by filtering.

At the end of the examination in chief by Mr. Atkinson, K.C., the case was adjourned to a date to be fixed.

New Cement Laboratory

FREE technical advice and the use of probably the finest laboratory of its kind in Europe have become available to the public by a scheme of centralisation of effort organised by the British Portland Cement Association. With the object of improving the advisory side of their work, this Association (which is a non-trading body) has arranged for the transfer of several existing laboratories to their premises in Westminster, and the concentration at one headquarters will add greatly to the usefulness of the work. The new organisation is intended to advise anyone on the subject connected with concrete or on cement in its application to concrete. Architects, builders, engineers, corporations, etc., can there obtain expert opinion on the material suitable for any particular work, and specimens of concrete or cement submitted will be tested free of charge on the most up-to-date apparatus. Private individuals also will be able to receive advice on any proposed development of their property, whether it be in the nature of a new carriage drive, garage, tennis court, "squash" court, or even the rendering of a wall.

Removing Oil in Exhaust Steam

THE question of utilising the heat from exhaust steam from engines is of considerable importance, but provision must be made for the separation of oil from the steam. In this connection economical efficiency is claimed for the Massip Separator, and this plant is the subject of a new illustrated leaflet from James Gordon and Co., Ltd., Windsor House, Kingsway, London, W.C.2. Important points in this separator are the large contact surface for depositing the oil and the slight centrifugal force imparted to the oil by the turn in the direction of the flow of steam through the Massip blades.

From Week to Week

A GRANT TO CHEMICAL RESEARCH has been voted by Magdalen College, Oxford.

A REDUCTION OF 6D. PER LB. in the price of British indigo is reported in the Manchester district.

MR. P. ROWSELL, F.C.S., was elected president of the Pharmaceutical Society of Great Britain on Wednesday.

SIR WILLIAM POPE contributes an appreciation of the late Professor Albin Haller, of Paris, to *Nature* of May 30.

DR. E. C. DODDS has been appointed to the London University chair of biochemistry at Middlesex Hospital Medical School.

A NEW ARTIFICIAL SILK PLANT erected by Courtaulds, Ltd., at Cornwall, Ontario, is nearly complete and is expected to be operating by July.

MR. H. C. DEWS, lately of 166, Long Lane, Dalton, Huddersfield, has been appointed metallurgist to Dewrance and Co., 165, Great Dover Street, London, S.E.1.

AMERICAN METHANOL PRODUCERS are applying for protection against dumping of German synthetic methanol and are also asking for a 50 per cent. increase in the 12 c. per gallon duty.

MR. T. WILLIAMSON has been appointed chairman of the Joint Industrial Council of the National Chemical Trade in the place of Mr. Roscoe Brunner, who has been made vice-chairman.

THE BRITISH ADVERTISING CONVENTION is to be established as an annual event. Sir P. Cunliffe-Lister, President of the Board of Trade, will open this year's convention at Harrogate from July 4 to 8.

VISITS TO THE NATIONAL PHYSICAL LABORATORY and to the works of the Gas Light and Coke Co. have been arranged for members attending the annual meeting of the Institution of Gas Engineers, on June 9 in London.

VICKERS, LTD., announce that they have received an official order from the Australian Government for two submarines. They have also been instructed to proceed with the construction of the gun mountains for one of the two cruisers building in this country.

A VERDICT of "Death by misadventure" was returned on Peter Nolan, a workman employed at the Muspratt works of the United Alkali Co., Ltd., who was killed by a pile falling on him. The coroner decided that the defect in the chain link was latent and all precautions had been taken.

SCALDS FROM BOILING DYE caused the death of George Cowling, an employee of the Yorkshire Dyeware and Chemical Co., of Selby, on Thursday, May 28. Cowling, who was handling logwood extractor plant, opened the door of a cistern containing the boiling dye in mistake for one containing the wood refuse.

APPLICATIONS ARE INVITED for the post of assistant chemist in the Government Laboratories, Federated Malay States, and assistant Government chemist for Zanzibar. In both cases applications should be sent to the Private Secretary (Appointments), Colonial Office, Downing Street, London, S.W.1, before June 30.

ESTHONIA'S CEMENT INDUSTRY is developing steadily. The Asserine Works turns out about 1,000 tons daily, most of which is exported. The Port Kunda Works, which had been closed for some time for alterations, has resumed work. The total export of cement in 1923 was valued at 93 million Esthonian marks; last year this was more than doubled, at 188 million E.mks.

TO CONSIDER THE DANGER of ethyl gas as a motor fuel a conference of scientists met on Wednesday, May 20, at Washington. Opinions varied considerably, and while manufacturers stated that it could be handled harmlessly with the use of gas masks, Professor Flynn, of Columbia University, said that animals inhaling the gas showed symptoms of lead poisoning and sometimes died apparently suffering from cramp.

IT IS REPORTED that the Note on the Conference of Ambassadors with regard to the disarmament of Germany to be presented on Thursday will demand the destruction of 30 Krupp lathes used in the manufacture of tubes for extracting nitrogen from the air. A representative of Krupp's is reported to have stated that if the destruction is carried out it would mean a serious temporary dislocation of the German nitrate industry, and the plant would have to be replaced to meet the requirements of nitrate manufacturers.

THE FIRST MEETING OF THE CREDITORS of the Shardlow Chemical Co., Ltd., 107, High Road, Beeston, Nottingham, was held on May 26 at the Official Receiver's offices, Nottingham. The company was incorporated in 1923 to take over a business, the purchase price being £8,250. On April 25, 1924, the company took over another business in consideration of £1,000 in shares, undertaking to pay the liabilities of the firm. On April 28 the liabilities expected to rank for dividend were put down at £3,454 18s. 7d., against estimated assets of £10,117 12s. 1d., and a loan on debentures of £6,904 16s. 10d., leaving a balance to meet unsecured creditors of £3,212 15s. 3d., and showing a deficiency as regarded creditors of £242 3s. 4d. It was decided to appoint Mr. S. Blythen, accountant, of Nottingham, as liquidator, with a committee of inspection.

THE HILL, HAMPSTEAD, the late Lord Leverhulme's residence, is to be sold.

THE "YADIL" PLANT, ETC., is to be sold by auction at Theobalds Road, London, W.C., on Monday, June 15.

SIR HERBERT E. MORGAN has joined the board of Lever Brothers, Ltd. He is a director of A. and F. Pears, Ltd.

FIRE caused considerable damage at the premises of the Dominion Rubber Co., Farringdon Road, London, on Thursday.

PROFESSOR H. WIELAND, of Freiburg-im-Baden, has been invited to succeed Professor Willstätter in the chair of chemistry at Munich University.

DEATH FROM EUCALYPTUS POISONING was recorded at the inquest on a Chelsea woman last week. It was stated to be the only case on record of such poisoning.

A LARGE TANK OF CHLORINE EXPLODED at Annemasse, near Geneva, on Monday. It is thought that the heat caused the accident. Fumes spread over the town and 50 persons were gassed.

FIRE CAUSED CONSIDERABLE DAMAGE at the Paragon Chemical Works, Baxenden, on Wednesday, May 27. A pan of hot pitch is thought to have overturned. The varnish room was gutted.

THE STARCH AND GLUCOSE INDUSTRY of Canada in 1923 is surveyed in a recent report now available from the Dominion Bureau of Statistics, Ottawa. The total products of the factories were valued at $5,135,103 during the year.

THE RECENT FRANCO-GERMAN POTASH AGREEMENT regulates sales in all export markets. It is proposed to open an office in Holland for the distribution of foreign orders, but there is stated to be no desire to monopolise trade or increase prices.

PROFESSOR K. FAJANS, of Munich University, has been invited to become professor and director of the Institute of Physical Chemistry in the University of Freiburg in succession to Professor G. Meyer. Professor Fajans has also been nominated a corresponding member of the Russian Academy of Science.

IN THE BIRTHDAY HONOURS LIST, Mr. Godfrey Rotter, D.Sc., Director of Explosives Research, War Office, receives the C.B.E. (civil), and the O.B.E. (civil) is awarded to Mr. H. C. Honey, Director of Gas Administration, Board of Trade, and Mr. W. A. Radley, Technical Adviser, Small Arms Ammunition, Royal Arsenal.

THE ANNUAL report of the Industrial Fatigue Research Board has just been issued for 1924. It mentions applications for assistance in solving specific problems in connection with conditions in various industries including pottery and also the use of coloured inks and papers, illumination, atmospheric conditions in mines, etc.

A PERMANENT INTERNATIONAL TRADE EXHIBITION will be opened at New Orleans, Louisiana, on September 15. Chemical, glassware, soap, and allied sections will be included, and details may be consulted at the Department of Overseas Trade (Exhibitions and Fairs Division), 2, Queen Anne's Gate Buildings, London, S.W.1.

THE FEDERAL PRIME MINISTER, Mr. S. M. Bruce, at Melbourne, has assured the Inter-State Conference, which the Federal Government had invited to discuss a future Commonwealth Institute of Science and Industry, that, provided it submits a scheme which is practicable and does not involve overlapping, he will recommend the Government to finance it.

AUSTRALIA IS INCREASING ITS FERTILISER PRODUCTION, for the Electrolytic Zinc Co. of Australia, Ltd., has acquired the acid plant from the Wallaroo Smelting Works and is expected to extend operations in the fertiliser industry. The Wallaroo-Mount Lyell Fertilisers Co., Ltd., has arranged for extensive plant additions to provide for an additional output of 5,000 tons.

THE KINGSLEY MEMORIAL MEDAL for 1925 has been awarded by the Chester Society of Natural Science to Professor P. G. H. Boswell, of Liverpool University. During the war he was scientific geological adviser to the Ministry of Munitions in Great Britain and America, being attached to various departments dealing with iron and steel, sands, etc., for glass making, potash and phosphates, and other materials.

BRITISH EXPORTERS OF CEMENT TO INDIA will watch with interest the scheme to pool the resources of all the cement manufacturing concerns in India with a view to stopping overseas imports. At present the total manufacturing capacity is about 600,000 tons a year, and the annual demand is only about 250,000 tons. Last year British cement imports were 98,000 tons. One British firm has already opened a branch factory in India.

THE FOLLOWING DOCTORATES have been conferred by London University: D.Sc. (Chemistry): Mr. R. W. West (Imperial College—Royal College of Science), for a thesis entitled "The Effect of Substituents on the Ease of Formation of, and on the Reactivity of the Bromine Atom in, Halogenated Malonyl Derivatives"; Mr. Thomas Iredale (University College), for a thesis entitled "Adsorption from the Gas Phase at a Liquid-Gas Interface, with special reference to the Adsorption of Vapours on a Mercury Surface"; and Mr. W. G. Palmer, for a thesis entitled "The Catalytic Activity of Copper," and other papers, together with two subsidiary contributions.

References to Current Literature

British

TEXTILES.—Recent developments in the chemistry of the cotton fibre. G. Tagliani. *J. Soc. Dyers and Col.*, May, 1925, pp. 165–168.

Eulan—a permanent protection against moth damage to textiles. C. O. Clark and J. Craft. *J. Soc. Dyers and Col.*, May, 1925, pp. 155–161.

ORGANO TELLURIUM COMPOUNDS.—Cyclotelluropentanediones containing aliphatic and aromatic substituents. G. T. Morgan and C. J. A. Taylor. *Chem. Soc. Trans.*, April, 1925, pp. 797–806.

CATALYSIS.—The interaction of hydrogen and carbon dioxide on the surface of platinum. C. R. Prichard and C. N. Hinshelwood. *Chem. Soc. Trans.*, April, 1925, pp. 806–811.

TECHNOLOGY.—The use of gas in industry. *Ind. Chem.*, May, 1925, pp. 191–196.

The separation of solids from gases. H. Seymour. *Ind. Chem.*, May, 1925, pp. 201–205.

EXPLOSIVES.—Permitted explosives: explosives authorised for use in fiery mines. W. G. Hiscock. *Ind. Chem.*, May 1925, pp. 173–179 and p. 181.

DYESTUFFS.—Celatene dyes and their application. J. S. Wilson. *J. Soc. Dyers and Col.*, May, 1925, pp. 169–172.

Recent developments in vat dyestuffs, with special reference to wool dyeing. J. Ferguson. *Ind. Chem.*, May, 1925, pp. 171–172.

DYEING.—The behaviour of wool as an amphoteric colloid. Part II. The chemical theory of dyeing. J. B. Speakman. *J. Soc. Dyers and Col.*, May, 1925, pp. 173–179.

FUEL.—Vapour pressures of binary and ternary fuel mixtures. J. S. Lewis. *J. Inst. Petroleum Tech.*, April, 1925, pp. 152–176.

PIGMENTS.—Chrome pigments, some applications and properties. W. J. Palmer. *J. Oil and Colour Chem. Assoc.*, April, 1925, pp. 90–100.

The stream-line filter applied to the filtration of pigments. J. A. Pickard. *J. Oil and Colour Chem. Assoc.*, February, 1925, pp. 35–46.

ELECTRO-CHEMISTRY.—The production of oxygen and hydrogen gases by electrolysis and their application in the arts and industries. Part III. J. B. C. Kershaw. *Ind. Chem.*, May, 1925, pp. 206–209.

United States

PYRROL.—Pyrrol from new sources—some uses. J. Michelman. *J. Ind. Eng. Chem.*, May, 1925, pp. 471–472.

ACETALS.—The relation of structure, affinity, and reactivity in acetal formation. Part I. H. Adkins and E. W. Adams. *J. Amer. Chem. Soc.*, May, 1925, pp. 1368–1381.

ENZYMES.—Industrial applications of invertase. H. S. Paine, C. F. Walton, and M. S. Badollet. *J. Ind. Eng. Chem.*, May, 1925, pp. 445–450.

ACIDS.—Catalytic transmutation of maleic acid into fumaric acid. E. M. Terry and L. Eichelberger. *J. Amer. Chem. Soc.*, May, 1925, pp. 1402–1412.

Oxidation of fumaric acid and of maleic acid to tartaric acid. N. A. Milas and E. M. Terry. *J. Amer. Chem. Soc.*, May, 1925, pp. 1412–1418.

FOODSTUFFS.—Whole and skimmed milk powders as food. Observations on a new vitamin for reproduction. L. T. Anderegg and V. E. Nelson. *J. Ind. Eng. Chem.*, May, 1925, pp. 451–455.

HYDROGENATION.—The hydrogenation of benzene in the presence of metallic copper. R. N. Pease and R. B. Purdum. *J. Amer. Chem. Soc.*, May, 1925, pp. 1435–1442.

REACTIONS.—The action of acid chlorides on trimethylamine. L. W. Jones and H. F. Whalen. *J. Amer. Chem. Soc.*, May, 1925, pp. 1343–1352.

The reaction of certain organic compounds with nitrogen pentoxide. L. B. Haines and H. Adkins. *J. Amer. Chem. Soc.*, May, 1925, pp. 1419–1426.

CORROSION.—Action of calcium chloride brines on galvanised coatings. A. C. White. *J. Ind. Eng. Chem.*, May, 1925, pp. 503–505.

PIGMENTS.—Manufacture of white lead by the Old Dutch or Stack process. W. R. Waelty. *Chem. Met. Eng.*, May, 1925, pp. 491–494.

SORPTION.—Absorption of ammonia in towers. O. L. Kowalke, O. A. Hougen and K. M. Watson. *Chem. Met. Eng.*, May, 1925, pp. 506–510.

Adsorption by activated sugar charcoal. Part II. Adsorbability of hydrogen and hydroxyl ions. E. J. Miller. *J. Amer. Chem. Soc.*, May, 1925, pp. 1270–1280.

OXIDATION.—Studies on the rate of oxidation of nitric oxide. Parts I and II. M. Latshaw, R. L. Hasche, and W. A. Patrick. *J. Amer. Chem. Soc.*, May, 1925, pp. 1201–1215.

French

PETROLEUM.—The origin of petroleum. P. E. Spielmann. *Rev. gén. des Sciences;* Part I, January 30, 1925, pp. 47–53; Part II, February 28, 1925, pp. 111–119.

QUINONES.—1-Arylamino-2-naphthoquinones. R. Lantz and A. Wahl. *Compt. rend.*, May 4, 1925, pp. 1351–1354.

HALOGEN COMPOUNDS.—Diacetylene hexabromide. M. Lespieau and C. Prevost. *Compt. rend.*, May 4, 1925, pp. 1347–1349.

The synthetic preparation of the homologues of benzyl chloride. M. Sommelet. *Compt. rend.*, May 4, 1925, pp. 1349–1351.

VISCOSE.—Contribution to the study of the viscose reaction. Part VII. B. Rassow and M. Wadewitz. *Rev. gén. des Matières Colorantes*, April, 1925, pp. 101–103.

DYESTUFFS.—Perylene. Part V. A. Roux and J. Martinet. *Rev. gén. des Matières Colorantes*, April, 1925, pp. 103–105.

KETONES.—The preparation of acyclic δ-diketones. E. E. Blaise and M. Montagne. *Compt. rend.*, May 4, 1925, pp. 1345–1346.

OXIDES.—Magnetic iron sesquioxide. H. Abraham and R. Planiol. *Compt. rend.*, May 4, 1925, pp. 1328–1329.

German

ACIDS.—The decomposition of nitrous acid by light and in the presence of catalysts. K. B. Mukerji and N. R. Dhar. *Z. Elektrochem.*, May, 1925, pp. 255–259.

RUBBER.—Uniform methods for rubber analysis. *Z. angew. Chem.*, May 21, 1925, pp. 459–470.

ARTIFICIAL SILK.—Artificial silk; its production, properties and use. Part I. E. Wurtz. *Chem. Apparatur*, May 10, 1925, pp. 84–85.

HYDROGENATION.—Contact reaction of α-pinene, a contribution to the study of dihydropinene. N. D. Zelinsky. *Ber.*, May 13, 1925, pp. 864–869.

TRIAZOLES.—Some general methods for the formation of 4-alkyl-1-phenyl-1 : 2 : 3-triazoles. A. Bertho. *Ber.*, May 13, 1925, pp. 859–864.

BENZOL.—Vacuum and steam distillation in the winning of benzol. H. Bähr and G. Rühl. *Glückauf*, May 9, 1925, pp. 574–580.

FERTILISERS.—Ammonium sulphate as a fertiliser. O. Nolte. *Glückauf*, April 18, 1925, pp. 460–464.

Miscellaneous

AMMONIA.—The synthesis of ammonia. Part III. G. Claude. *Bull. Féd. Ind. Chim. Belg.*, March, 1925, pp. 133–137.

OXIDATION.—The electrochemical oxidation of anethol and isoeugenol. F. Fichter and A. Christen. *Helv. Chim. Acta*, May 2, 1925, pp. 332–336.

REACTIONS.—On the influence of impurities in zinc on its solubility in acids. R. Vondracek and J. Izak-Krizko. *Rec. Trav. Chim. Pays-Bas*, May, 1925, pp. 376–389.

Action of sulphuric acid and anhydride on acetylene dichlorides. H. Lepouse. *Bull. Soc. Chim. Belg.*, March, 1925, pp. 133–142.

The precipitation of ferric salts with ammonium sulphide. H. Krepelka and W. Podrouzek. *Rec. Trav. Chim. Pays-Bas*, May, 1925, pp. 416–424.

QUINONES.—1 : 2-Diamino-4 : 5-*o*-quinone and some derivatives thereof. E. Hoehn. *Helv. Chim. Acta*, May 2, 1925, pp. 275–280.

COPPER COMPOUNDS.—Trivalent copper. M. Vrtis. *Rec. Trav. Chim. Pays-Bas*, May, 1925, pp. 425–434.

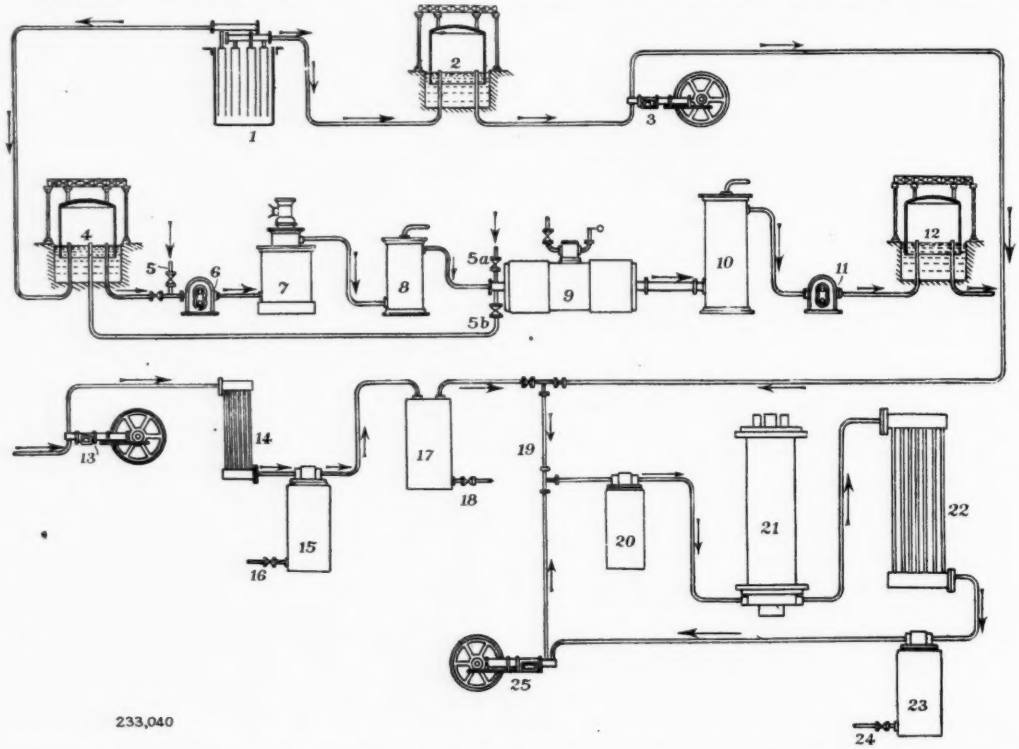
TERPENES.—Ring formation with the sesquiterpenes. L. Ruzicka and E. Capato. *Helv. Chim. Acta*, May 2, 1925, pp. 259–274.

Patent Literature

Abstracts of Complete Specifications

233,038. Combustible Gas, Manufacture of. H. O. Loebell, 301, West 109th Street, New York. Application date, January 31, 1924.

Fuel is passed downwards in a column through a producer, and air is blown through to maintain a high temperature zone in the mid or lower portion of the column. The blast gases are passed through a regenerator, which is thus heated by the sensible heat, and by the heat of combustion of the gases, and water is then introduced to generate steam. The steam is passed into the high temperature zone of the producer, and the gas generated is passed through the fuel in the upper part of the producer. The fuel passes downwards at such a rate that unburned fuel is discharged at the bottom. A detailed description of the plant is given.



233,040

233,040. Ammonia, Synthesis of. L. Casale, 9, Via del Parlamento, Rome. Application date, January 31, 1924.

The object is to lower the cost of the manufacture of synthetic ammonia by utilising the by-products, *e.g.*, oxygen from the electrolysis of water, which is employed for the gasification of fuel and combustion of the gas to produce nitrogen for the synthesis. The mixture of nitrogen and carbon dioxide is separated by high pressure and cooling.

Hydrogen passes from the electrolyser 1 to a gasometer 2, and thence to a multiple stage compressor 3. Oxygen passes to a gasometer 4, and thence to a fan 6, which delivers it with air to a producer 7 containing lignite or peat. The gas obtained passes through a purifier 8 to a boiler 9, where it is burnt with air and with oxygen supplied through the pipe 5*b*. The steam generated drives the electric generator which supplies current for the electrolysis, and the condensed steam is supplied to the electrolyser. The combustion gases from the boiler 9 are washed and cooled in a condenser 10, and pass on to a gasometer 12. The gases are then compressed by a pump 13 to 100–1,000 atmospheres, and are then cooled below 30° C. in a refrigerator 14, so that liquid carbon dioxide may be drawn off into the vessel 15. The remaining nitrogen passes through a scrubber 17 to remove traces of carbon dioxide, and then meets the hydrogen from the compressor 3. The mixture in the correct proportions passes to a purifier 20, and thence to the catalyser 21, and the ammonia obtained passes to a refrigerator 22 and is collected in a vessel 23. The remaining gases are returned to the circuit by a pump 25.

233,080. Hydrocyanic Acid and Cyanides. J. Y. Johnson, London. From Badische Anilin and Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, February 19, 1924.

Hydrocyanic acid or ammonium cyanide can be obtained by passing formamide or ammonium formate at a high temperature with a diluent gas over a catalyst capable of removing water. Suitable diluent gases are nitrogen, hydrogen, carbon monoxide, blue water gas, producer gas, and ammonia. In the last instance, the hydrocyanic acid produced combines with the ammonia to form ammonium cyanide. The compounds treated may be sprayed into the diluent gas, or vaporised and mixed with it, and a mixture of formamide and ammonium formate, which is liquid at ordinary temperatures, is particularly suitable. The higher temperatures are employed when the gas contains ammonia, and the gas is passed rapidly through the apparatus.

In an example, formamide is atomised by ammonia gas, and passed at 300°–350° C. over a catalyst obtained by applying a paste of manganese carbonate to granulated bauxite, and drying and reducing with hydrogen or methanol. The speed of the gas current may be 0·5–20 metres per second, and the resulting hydrocyanic acid is absorbed in ammonia. The yield of ammonium cyanide is 85 per cent. Other examples are given of the treatment of mixtures of ammonium formate and formamide, employing other catalysts such as bauxite poor in iron. The above mixtures are readily obtained by heating ammonium formate to 120°–150° C.

233,137. Gaseous Fuel From Lime Kiln Gases. The British and Foreign Lime and Power Corporation, Ltd. County Chambers, Corporation Street, Birmingham, and T. A. Reid, 4, Cecil Road, Muswell Hill, London, N. Application date, May 3, 1924. Addition to 188,022.

The hot gases passing through a converter in which carbon dioxide and steam are converted into carbon monoxide and hydrogen, are then passed through a retort containing bitum-

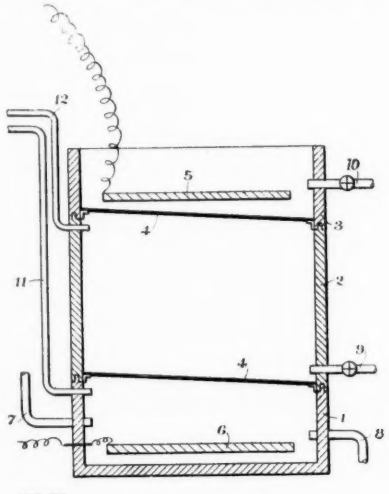
inous coal to distil it destructively. The gases then pass through a washer to recover tar and ammonia, leaving the gases enriched by permanent hydrocarbons. The limestone is dried by hot exhaust gases from a gas engine, and the enriched gas may be used to adjust the thermal value of coal gas. The lime kiln is heated by burning some of the producer gas.

233,188. Basic Lead Sulphate, Manufacture of. W. J. Mellersh-Jackson, London. From The Eagle Picher Lead Co., 1,030, Broadway, Cincinnati, Ohio, U.S.A. Application date, June 26, 1924.

The object is to obtain a finely divided basic lead sulphate suitable for use as a pigment. Metallic lead is atomised and sprayed into a furnace containing free oxygen and sulphur dioxide gas in suitable proportions, yielding a basic lead sulphate with a high percentage of combined lead oxide. The best results are obtained when the basic sulphate contains not less than 16 per cent. of combined lead oxide, and no uncombined oxide. The pigment is comparable with high-grade lithopone. The process is carried out by atomising and injecting the lead into an elongated furnace, where it burns and combines with the sulphur dioxide. Reference is directed in pursuance of Sect. 7; Sub-sect. 4 of the Patents and Designs Acts, 1907 and 1919, to specification 100,069.

233,196. Organic Acids and Bases from Beetroot Molasses, Process of Separating and Collecting. Y. Takayama, 44, Tosaki Cho, Koishi-kawa-Ku, Tokyo, Japan. Application date, July 5, 1924.

The process is for obtaining organic acids such as glutamic, glutimic, succinic, etc., and bases such as betaine, alkali, by



233,196

electrolysing beetroot molasses or residue of fermented molasses. A trough 2 is divided by slightly inclined permeable partitions 4, 4^1, and a cathode 5 of iron or carbon is placed in the upper compartment and anode 6 of iron, zinc or aluminium in the lower compartment. Outlet pipes 11, 12, are provided to draw off gases, and pipes 8, 10, to draw off liquid after electrolysis. Electrolyte is fed in through a pipe 9, and water through a pipe 7. The trough is charged with beetroot molasses, or the residue after alcoholic fermentation, and electrolysed. Caustic alkali, betaine, etc., collect in the cathode compartment, and salts formed by glutamic acid, glutimic acid, succinic acid, etc., with the anode metal collect in the anode compartment. Diffusion of these salts into the central compartment is prevented by their constant discharge and replacement by water. Potash and soda are recovered from the cathode liquor by converting them into chlorides, sulphates or carbonates, concentrating and crystallising. Betaine is then extracted from the liquor with alcohol. If the anode was of iron, the anode liquor is treated with caustic alkali, sodium carbonate, or milk of lime; if of zinc, sulphuretted hydrogen is employed. The liquor is then treated with hydrochloric or sulphuric acid, and glutimic acid is converted into glutamic acid, which is recovered by adding slaked lime. Succinic acid may then be crystallised out.

233,263. Soluble Cellulose Esters, Process of Manufacturing. Soc. de Stearinerie et Savonnerie de Lyon, 58, Chemin de Gerland, Lyons, and P. Berthon, 56, Chemin de Gerland, Lyons, France. Application date, November 28, 1924. Addition to 201,510.

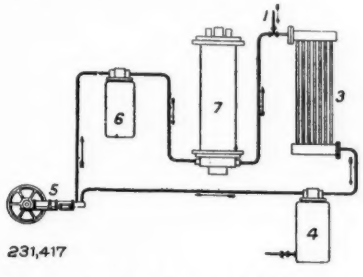
Specification 201,510 (see The Chemical Age, Vol. IX, p. 349) describes the production of soluble cellulose esters by condensing acid chlorides of the higher fatty acids with hydrocellulose in the presence of a diluent such as chloroform, carbon tetrachloride, halogen derivatives of acetylene, benzene, etc. In this invention, the diluent is toluene, xylene, or the homologous higher hydrocarbons of the benzene series.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention:—215,012 (Soc. Alsacienne de Produits Chimiques) relating to manufacture of sulphurised compounds of phenol and their application as mordants, see Vol. XI, p. 17; 216,499 (Oesterreichische Chemische Werke Ges.) relating to manufacture of hydrogen peroxide from persulphuric acid or persulphates, see Vol. XI, p. 148; 222,093 (Metallbank und Metallurgische Ges. and W. Gensecke) relating to purifying oils and fats in vacuo by means of steam, see Vol. XI., p. 530; 225,187 (Naamlooze Vennootschap Philips Gloeilampenfabrieken) relating to manufacture of hafnium and zirconium compounds, see Vol. XII., p. 115; 225,509 (Kohlenscheidungs Ges.) relating to low temperature distillation of coal, see Vol. XII., p. 116.

International Specifications not yet Accepted

231,417. Ammonia Synthesis. L. Casale, 9, Via del Parlamento, Rome. International Convention date, March 29, 1924.

The gases for ammonia synthesis are purified by treating with ammonia gas in excess of that required to combine



231,417

with the carbon oxides, hydrogen sulphide, nitric oxide, and other acid compounds. Ammonia is produced in the catalyser 7 and condensed in the condenser 3, and the highly compressed gases are introduced at 1. The condensate containing the impurities dissolved in it flows into the receiver 4, and the purified gases pass back to the catalyser 7 through a pump 5 and separator 6.

231,446. Dyes. Society of Chemical Industry in Basle, Switzerland. International Convention date, March 28, 1924.

Chromium compounds of dyestuffs are obtained by the reaction of a triarylmethane dye which can be chromed, and a chromium compound of an azo dyestuff which can be chromed. Examples are given in which the chromium compounds of the azo dyestuff from 1-amino-2-oxynaphthalene-4-sulphonic acid and α- or β-naphthol are boiled with Eriochromazurol B or Eriochromcyanine R or the dyestuff from 1-naphthol-2-carboxylic acid and tetrachlormethane and the product salted out. The dyes may also be produced on the fibre.

231,453. Distilling Bituminous Schist, etc. Soc. Lyonnaise des Schistes Bitumineux, 73, Boulevard Haussmann, Paris. International Convention date, March 26, 1924.

Bituminous schist, asphalt rock or lignite is distilled in a vertical retort through which gas, steam, and air are passed, the gas being in excess of that required for combustion, so that the atmosphere is reducing. The charge passes through the distillation zone in 8-10 hours, and through the gasifying zone in 10-15 hours, the temperatures being 550° C. for distillation and 950°-1000° C. for gasifying. The gas generated may be used in the retort, and the air may be preheated in passing upwards through the lowest zone of the retort.

231,455. DYEING CELLULOSE ACETATE. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, March 31, 1924.

Cellulose acetate is dyed with monoazo dyestuffs containing one or more diazotisable groups, and the shades are diazotised and developed with alkyl- or aralkyl-α-naphthylamines. Examples are given in which (1) the material dyed with the monoazo dye 1-naphthylamine-6-sulphonic acid→α-naphthylamine is diazotised and developed with alkyl-α-naphthylamine, giving violet-black shades; (2) the material is dyed with the monoazo dye *o*-chloraniline→1-naphthylamine-2-sulphonic acid and developed as before, giving a bluish-black; (3) the monazo dye *m*-nitraniline→*o*-anisidine is used as above; (4) the reduction product of the monoazo dye *p*-nitraniline→4-chlor-2-aminoanisol is used as above. A number of other components are also given.

231,458. CATALYSTS. Benzonaftene, 7, Via Meravigli, Milan, Italy. International Convention date, March 26, 1924.

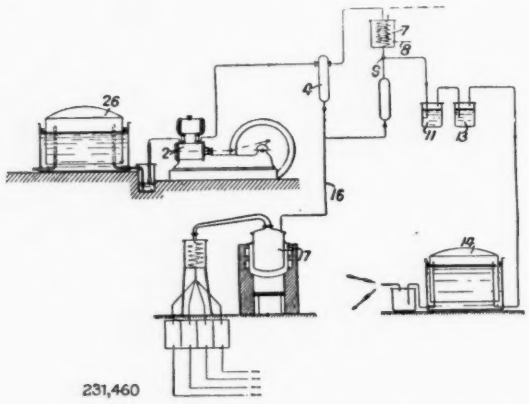
The activity of catalysts such as iron oxide, cerium oxide, thorium oxide, reduced copper, iron or nickel can be increased by adding sodium formate. The catalyst is preferably added to a concentrated solution of sodium formate to form a paste.

231,459. OBTAINING HYDROCARBON OILS AND GASES. Benzonaftene, 7, Via Meravigli, Milan, Italy. International Convention date, March 26, 1924.

Oil flows through a horizontal trough in a retort heated to 450°-600° C., the inside surface of the top of the boiler being coated with a catalytic paste of cerium and thorium oxides, reduced copper and nickel, and sodium silicate and formate solutions. The inlet end is treated with a mixture of cerium oxide and reduced copper, and the outlet end with thorium oxide and reduced nickel. The vapours are cooled to 30° C., and those remaining uncondensed are cooled to 15° C. in a second condenser, and then pass through a chamber coated with ferric oxide and reduced iron which is heated to 250°-300° C. Any remaining vapour is cooled to 10° C.

231,460. SEPARATING GASEOUS MIXTURES. Benzonaftene, 7, Via Meravigli, Milan, Italy. International Convention date, March 26, 1924.

The gases remaining after the treatment described in 231,459 above are drawn from a holder 26 and forced by a



231,460

pump 2 at a pressure of 20 atmospheres through a liquid separator 4 to a coil 7 cooled by circulation of brine. Further liquefaction occurs in an expansion vessel 9, and the liquid passes to a water-jacketed still 17 from which products such as petroleum ether, gasoline, and ligroine are obtained by fractional distillation. The gases pass through sulphuric acid 11, heated to 150° C., or through bromine to absorb ethylene, and then through water 13 to a holder 14.

LATEST NOTIFICATIONS.

234,458. Method for the continuous manufacture of ethers of the fatty or the aromatic series. Soc. Anon. des Distilleries des Deux-Sèvres. May 24, 1924.

234,470. Manufacture of brown sulphurized dyestuffs. Akt.-Ges. für Anilin-Fabrikation. May 23, 1924.

234,485. Process for the manufacture of aluminium fluoride. Rütgerswerke-Akt.-Ges. May 26, 1924.

234,518. Manufacture of titanic acid. Deutsche Gasglühlicht-Auer-Ges. May 24, 1924.

Specifications Accepted with Date of Application

208,175. Hydrocarbons and other liquids containing constituents of high boiling point, Continuous rectification of. Soc. des Etablissements Barbet. December 11, 1922.

212,252. Vat dyes, Process for manufacturing. H. Pereira. March 2, 1923.

215,782 and 220,930. Vat dyestuffs, Manufacture of. Farbwerke vorm. Meister, Lucius and Brüning. May 9, 1923, and August 21, 1923. 220,930 addition to 215,782.

222,821. Lead products containing lead oxychloride, Process for the dechlorination of. A. Nathansohn. February 19, 1924.

226,512. Gases containing oxygen, Means for deoxidising. Metropolitan-Vickers Electrical Co., Ltd. December 21, 1923.

230,415. Cupriferous pyrites, Processes for the treatment of. F. Curtius and Co. March 10, 1924.

233,813. Cellulose acetate, Dyeing of. British Dyestuffs Corporation, Ltd., J. Baddiley and H. Browning. February 27, 1924.

233,840. Active absorbing carbon and phosphoric acid and its compounds, Process for the manufacture of. R. Duncalfe, R. B. Drew, and J. O. Cutter. March 29, 1924.

233,874. Cellulose derivative compositions. W. G. Lindsay. May 5, 1924.

233,909. Soap, Manufacture of. O. Scherieble. June 17, 1924.

233,936. Precipitating calcium saccharate from liquids containing sugar, and separating excess lime therefrom, Process and apparatus therefor. C. Steffen, sen., and C. Steffen, jun. July 30, 1924.

Applications for Patents

Badische Anilin- and Soda-Fabrik and Johnson, J. Y. Manufacture of colouring-matter pastes. 14,174. May 29.

Badische Anilin- and Soda-Fabrik and Johnson, J. Y. Manufacture of solid calcium nitrates. 14,175. May 29.

Barton, F. Carbonization and distillation of peat, etc. 13,990. May 28.

Bloxham, A. G., and Chemische Fabrik Griesheim-Elektron. Manufacture of dyestuffs. 14,226. May 29.

British Dyestuffs Corporation, Ltd., Henderson, J. A. R., Horsfall, R. S., and Lawrie, L. G. Dyeing acetate silk. 14,202. May 29.

Carpmael, W., and Farbenfabriken vorm. F. Bayer and Co. Manufacture of trisazo dyestuffs. 14,215. May 29.

Cooke, E. A. Purification of natural soda. 13,951. May 28.

Durand et Huguenin Soc. Anon. Production of fast dyeings and prints on fibrous goods, etc. 14,060. May 28. (Germany, March 9, 1923.)

Goldschmidt Akt.-Ges., T. Production of chlorine compounds of the lower homologues of ethylene. 13,714. May 26. (Germany, June 10, 1924.)

Haglund, T. R. Production of aluminium oxide, etc. 14,064. May 28. (Sweden, June 2, 1924.)

Holder, H. N. Formaldehyde compositions. 13,719. May 26.

International Nickel Co. Separating nickel and copper from copper-nickel mattes, etc. 14,072. May 28. (United States, Sept. 30, 1924.)

Johnson, J. Y., and Smith, Drum and Co. Dyeing machines. 13,761. May 26.

Jones, J. I. M., Morton, J., Morton Sundour Fabrics, Ltd., and Wylam, B. Dyes and dyeing. 13,638. May 25.

Krupp Grusonwerk Akt.-Ges., F., Treatment of sulphide ores, etc. 14,025. May 28. (Germany, May 30, 1924.)

Krupp Grusonwerk Akt.-Ges., F. Apparatus for the extraction of oil from fats. 14,038. May 28. (Germany, June 10, 1924.)

McDermott, T. Softening water of and preventing scale in steam-boilers. 14,101. May 29.

Mackay, P. A. Manufacture of titanium oxide. 14,067. May 28.

Mayer and Sohn, J. Recovery of chromium as chromate from waste materials. 13,736. May 26. (Germany, June 16, 1924.)

Norsk Hydro-Elektrisk Kvælstofaktieselskab. Synthesis of hydrogen cyanide. 14,041. May 28. (Norway, June 3, 1924.)

Preston, H. J. Ammonia refrigerating plant. 13,967. May 28.

Rhenania Verein Chemischer Fabriken Akt.-Ges. Manufacture of fertilizers, etc. 13,918. May 27. (Germany, June 23, 1924.)

Rhenania Verein Chemischer Fabriken Akt.-Ges. Manufacture of fertilizers, etc. 13,940. May 27. (Germany, August 1, 1924.)

Rogers, W. P. Manufacture of hydrogen. 14,220. May 29.

Salomon, M. S. Production of dehydrating bodies. 14,012. May 28.

Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. Purification of hydrogen. 13,750. May 26. (France, April 9.)

Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 14,224. May 29. (Switzerland, June 17, 1924.)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, June 5, 1925.

BUSINESS is very quiet this week under the influence of the Whitsuntide holidays. Trade in the North is at a complete standstill, as is usual in Whit-week. Prices remain remarkably steady, stocks being very small and firmly held. There has been a slight improvement in the export demand.

General Chemicals

ACETONE is in very short supply for early delivery. Price unchanged.

ACID ACETIC is in fair demand, being unchanged at £39 per ton for 80% technical and £40 per ton for 80% pure.

ACID CITRIC is most disappointing, no interest being taken in the article at all.

ACID FORMIC is in fair demand at £49 to £50 per ton for 85% technical.

ACID LACTIC.—Business is quieter than last week but the market is firm at £43 per ton for 50% by weight.

ACID OXALIC is slow market. To-day's quotation is 3¾d. per lb.

ACID TARTARIC is quiet and unchanged at 11½d. per lb.

ALUMINA SULPHATE.—The fight between the makers continues and further reductions in price are only obtainable under great difficulties.

ARSENIC.—There is little business. Quotation remains nominally £24 to £25 per ton.

BARIUM CHLORIDE is rather lower in price at £9 15s. to £10 per ton.

CREAM OF TARTAR is in good demand, being quoted at £74 to £78 per ton according to quality.

EPSOM SALTS.—Unchanged.

FORMALDEHYDE is in very small demand. Price £40 to £41 per ton.

LEAD ACETATE is quieter, but price is influenced in an upward direction by the advance in lead.

LIME ACETATE is weak and a further fall in price is not unlikely.

METHYL ALCOHOL.—There is no demand, but, as mentioned last week, stocks are non-existent. The nominal quotation is £45 per ton, c.i.f. English ports.

POTASSIUM CHLORATE remains scarce. Small stocks are firmly held. Price 4⅜d. to 4½d. per lb.

POTASSIUM PRUSSIATE is an active market. Spot stocks commanding 7½d. to 7¾d. per lb.

SODA ACETATE.—Unchanged at about £21 10s. per ton, with little interest being taken in the article.

SODA BICHROMATE.—Price unchanged; demand good.

SODA HYPOSULPHITE is without feature.

SODA PRUSSIATE is firm at 4¼d. to 4⅜d. per lb.

SODA NITRITE has been more inquired for. Price £22 10s. to £22 15s. per ton.

SODA SULPHIDE.—Unchanged.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

There is little change to report in the market for coal tar products since last week.

90% BENZOL remains steady at 1s. 8d. to 1s. 9d. per gallon on rails.

PURE BENZOL is still quoted at 1s. 10d. to 1s. 11d. per gallon on rails.

CREOSOTE OIL is steady at 5¾d. to 6d. per gallon on rails in the North, while the price in London remains at 7d. to 7¼d. per gallon.

CRESYLIC ACID remains dull and is quoted at 1s. 8d. to 1s. 9d. per gallon on rails in bulk for the Pale quality 97/99%, while the Dark quality 95/97% is quoted at 1s. 6½d. to 1s. 7d. per gallon on rails.

SOLVENT NAPHTHA is steady at 1s. 3½d. per gallon on rails.

HEAVY NAPHTHA is unchanged and is quoted at 1s. 1d. to 1s. 2d. per gallon on rails.

NAPHTHALENES are in poor demand, the lower grades being worth from £3 5s. to £3 15s. per ton, while 74/76° quality is quoted at £5 to £5 10s. per ton, and 76/78° quality at £6 to £6 10s. per ton.

PITCH remains dull owing to poor demand. Prices are unchanged at 40s. to 42s. 6d. per ton, f.o.b. main U.K. ports.

Latest Oil Prices

LONDON.—Linseed oil quiet and 2s. 6d. to 5s. lower. Spot, £45 10s.; June and July-August, £44 10s.; September-December, £44 12s. 6d; Rape oil steady but quiet. Crude crushed, spot, £50 10s.; technical refined, £53 10s. Cotton oil, firm. Refined common edible, £47; Egyptian, crude, £42 10s.; deodorised, £49. Turpentine flat and 1s. to 2s. per cwt. lower; American, spot, 70s.; June, 69s.; and July-December, 68s. 9d., sellers.

HULL.—Linseed oil, spot to September-December, £44 10s. Cotton oil, Bombay crude, £38 10s.; Egyptian crude, £42; edible refined, £45 10s.; deodorised, £47 10s.; technical, £41 15s. Palm kernel oil, crushed, naked, £42 10s. Groundnut oil, crushed-extracted, £48; deodorised, £52; Soya oil, extracted, £41; crushed, £42; deodorised, £48. Rape oil, extracted, £49 10s. per ton, net cash terms, ex mill. Castor oil and cod oil unaltered.

Nitrogen Products Market

Export.—During the last week or two demand has been fairly quiet, as buyers were holding off for the announcement of June prices. British producers are now quoting on the basis of £12 2s. 6d. per ton f.o.b., nitrogen basis 20·6 per cent. Considerable sales have been made for June/July shipment.

Home.—The end of May witnessed the usual decline in demand, as the season is practically over. June prices are £12 5s. per ton in 4-ton lots to consumers' nearest station: basis, 21·1 per cent. nitrogen. When the cost of home distribution and the different nitrogen bases are considered, it will be observed that the home price is below the export price. The large drop in price is due to the increased synthetic production both at home and abroad and the announcement by the Germans of lower prices for this season.

Nitrate of Soda.—Market continues firm, cargoes having changed hands at £11 13s. 6d. to £11 18s. 6d. per ton, c.i.f. chief European ports. It is understood that the nitrate scale has been fixed for the year commencing July 1, but only meagre information has come to hand and the scale will commence at the same figure as last year. The fall clause will apply in the event of prices being reduced later.

American Market Movements

(From *Drug and Chemical Markets.*)

HEAVY movement of chemicals on contract continues to be reported by makers. Spot trading quiet. Prices show very little change in either direction.

Business in fine chemicals is large from the standpoint of primary producers, but quiet with very few changes in price. No changes of any importance were made this week.

Benzene unchanged although undertone is stronger. Other light oils easy. Cresylic acid firmer. Pyridine steady. Intermediates remain quiet. Para-nitroaniline shaded.

Vegetable oils generally firm at unchanged prices. Animal oils in a mixed state. Fish oils moving in increasing volume at firm prices.

New Form for Fertilisers

FERTILISERS in pellet form, capable of being applied by means of drills and seed planters are being tested in America. The possibilities of applying the fertiliser as the seed is sown are being investigated by agricultural authorities.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at retailers' works.

General Heavy Chemicals

Acid Acetic, 40% Tech.—£21 to £23 per ton.
Acid Boric, Commercial.—Prices reduced by £5 per ton. Crystal, £40 per ton, Powder, £42 per ton.
Acid Hydrochloric.—3s. 9d. to 6s. per carboy d/d., according to purity, strength and locality.
Acid Nitric, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 65s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia Alkali.—£6 15s. per ton f.o.r. Special terms for contracts.
Bleaching Powder.—Spot, £10 10s. d/d; Contract, £10 d/d. 4 ton lots.
Bisulphite of Lime.—£7 10s. per ton, packages extra, returnable.
Borax, Commercial.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
Calcium Chlorate (Solid).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carriage paid.
Copper Sulphate.—£25 to £25 10s. per ton.
Methylated Spirit 64 O.P.—Industrial, 2s. 7d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
Nickel Sulphate.—£38 per ton d/d. Normal business.
Nickel Ammonia Sulphate.—£38 per ton d/d. Normal business.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate.—5d. per lb.
Potassium Chlorate.—2¾d. to 3d. per lb.
Salammoniac.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton. Carr. pd.
Salt Cake.—£3 15s. to £4 per ton d/d. In bulk.
Soda Caustic, Solid.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
Soda Crystals.—£5 to £5 5s. per ton ex railway depots or ports.
Sodium Acetate 97/98%.—£24 per ton.
Sodium Bicarbonate.—£10 10s. per ton, carr. paid.
Sodium Bichromate.—4d. per lb.
Sodium Bisulphite Powder 60/62%.—£16 to £17 per ton, according to quantity, f.o.b., 1-cwt. iron drums included.
Sodium Chlorate.—2¾d. per lb.
Sodium Nitrate refined 96%.—£13 5s. to £13 10s. per ton, ex Liverpool. Nominal.
Sodium Nitrite 100% basis.—£27 per ton d/d.
Sodium Sulphate (Glauber Salts).—£3 12s. 6d. per ton.
Sodium Sulphide conc. solid. 60/65.—About £15 per ton d/d. Contract £14 15s. Carr. pd.
Sodium Sulphide Crystals.—£9 5s. per ton d/d. Contract £9 2s. 6d. Carr. pd.
Sodium Sulphide, Pea Crystals.—£15 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

Acid Carbolic Crystals.—5d. per lb. Quiet demand. Crude 60's, 1s. 5d. to 1s. 6d. per gall. Demand negligible.
Acid Cresylic 97/99.—1s. 8d. to 2s. per gall. Fair business. Pale, 95%, 1s. 6d. to 1s. 10d. per gall. Dark, 1s. 6d. to 1s. 9d. per gall. Little demand.
Anthracene Paste 40%.—3d. to 4d. per unit per cwt.—Nominal price. No business.
Anthracene Oil, Strained.—7d. to 8d. per gall. Unstrained, 6d. to 7d. per gall.
Benzol.—Crude 65's.—9d. to 11½d. per gall., ex works in tank wagons. Standard Motor, 1s. 4½d. to 1s. 6d. per gall., ex works in tank wagons. Pure, 1s. 9½d. to 1s. 11d. per gall., ex works in tank wagons.
Toluol.—90%, 1s. 7d. to 1s. 8d. per gall. More inquiry. Pure, 1s. 10d. to 2s. per gall. Steady demand.
Xylol Commercial.—2s. 3d. per gall. Pure, 3s. 3d. per gall.
Creosote.—Cresylic, 20/24%, 8d. to 8½d. per gall. Little demand. Middle Oil, Heavy, Standard specification, 5½d. to 6½d. per gall., according to quality and district. Market steady.
Naphtha.—Crude, 8d. to 9d. per gall. Solvent 90/160, 1s. 4d. to 1s. 6d. per gall. Demand good. Solvent 90/190, 11½d. to 1s. 1d. per gall. Steady business.
Naphthalene Crude.—Cheaper in Yorkshire than in Lancashire. Drained Creosote Salts, £3 to £5 per ton. Demand falling off. Whizzed or hot pressed. £6 to £9 per ton.
Naphthalene.—Crystals and Flaked, £12 to £15 per ton, according to districts. Very quiet.
Pitch.—Medium soft, 35s. to 40s. per ton, according to district. No export business until next season.
Pyridine.—90/160, 19s. to 19s. 6d. per gall. Market more active. Fair demand. Heavy, 11s. 6d. to 12s. per gall. More inquiry.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

Acetic Anhydride 95%.—1s. 7d. per lb.
Acid H.—3s. 9d. per lb. 100% basis d/d.
Acid Naphthionic.—2s. 2d. per lb. 100% basis d/d.
Acid Neville and Winther.—5s. 8d. per lb. 100% basis d/d.
Acid Salicylic, technical.—11d. to 11½d. per lb. Steady demand.
Acid Sulphanilic.—9d. per lb. 100% basis d/d.
Aluminium Chloride, anhydrous.—10d. per lb. d/d.
Aniline Oil.—7½d. per lb. naked at works.
Aniline Salts.—8d. per lb. naked at works.
Antimony Pentachloride.—1s. per lb. d/d.
Benzidine Base.—3s. 8d. per lb. 100% basis d/d.
Benzyl Chloride 95%.—1s. 1d. per lb.
p-Chlorphenol.—4s. 3d. per lb. d/d.
p-Chloraniline.—3s. per lb. 100% basis.
o-Cresol 29/31° C.—3d. per lb. Demand quiet.
m-Cresol 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
p-Cresol 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
Dichloraniline.—2s. 3d. per lb.
Dichloraniline S. Acid.—2s. 3d. per lb. 100% basis.
p-Dichlorbenzol.—£85 per ton.
Diethylaniline.—4s. 3d. per lb. d/d., packages extra, returnable.
Dimethylaniline.—2s. 2d. per lb. d/d. Drums extra.
Dinitrobenzene.—9d. per lb. naked at works.
Dinitrochlorbenzol.—£84 10s. per ton d/d.
Dinitrotoluene.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 1s. per lb. naked at works.
Diphenylaniline.—2s. 10d. per lb. d/d.
G. Salt.—2s. 2d. per lb. 100% basis d/d.
Monochlorbenzol.—£63 per ton.
a-Naphthol.—2s. 3d. per lb. d/d.
B-Naphthol.—1s. per lb. d/d.
a-Naphthylamine.—1s. 3½d. per lb. d/d.
B-Naphthylamine.—3s. 9d. per lb. d/d.
m-Nitraniline.—4s. 2d. per lb. d/d.
p-Nitraniline.—2s. 2d. per lb. d/d.
Nitrobenzene.—5½d. per lb. naked at works.
o-Nitrochlorbenzol.—2s. 3d. per lb. 100% basis d/d.
Nitronapthalene.—10d. per lb. d/d.
p-Nitrophenol.—1s. 9d. per lb. 100% basis d/d.
p-Nitro-*o*-amidophenol.—4s. 6d. per lb. 100% basis.
m-Phenylene Diamine.—4s. per lb. d/d.
p-Phenylene Diamine.—9s. 9d. per lb. 100% basis d/d.
R. Salt.—2s. 4d. per lb. 100% basis d/d.
Sodium Naphthionate.—2s. 2d. per lb. 100% basis d/d.
o-Toluidine.—10d. per lb.
p-Toluidine.—2s. 3d. per lb. naked at works.
m-Toluylene Diamine.—4s. per lb. d/d.

Wood Distillation Products

Market quiet in sympathy with general commercial depression.

Acetate of Lime.—Brown £9 10s. to £10. Quiet market. Grey, £15 per ton. Liquor, 9d. per gall. 32° Tw.
Acetone.—£73 per ton.
Charcoal.—£7 5s. to £8 10s. per ton, according to grade and locality. Fair demand.
Iron Liquor.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.
Red Liquor.—10d. to 1s. per gall. 14/15° Tw.
Wood Creosote.—2s. 9d. per gall. Unrefined.
Wood Naphtha, Miscible.—4s. 3d. per gall. Only moderate market. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P.
Wood Tar.—£4 per ton. Demand slack.
Brown Sugar of Lead.—£43 per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 7½d. to 1s. 5d. per lb., according to quality. Crimson, 1s. 5d. to 1s. 7½d. per lb., according to quality.
Arsenic Sulphide, Yellow.—2s. per lb.
Cadmium Sulphide.—4s. 4d. per lb., according to quantity.
Carbon Bisulphide.—£32 to £35 per ton, according to quantity.
Carbon Black.—6d. to 6½d. per lb., ex wharf.
Carbon Tetrachloride.—£62 to £67 per ton, according to quantity drums extra.
Chromium Oxide, Green.—1s. 4d. per lb.
Indiarubber Substitutes, White and Dark.—5½d. to 7½d. per lb.
Lamp Black.—£48 per ton, barrels free.
Lead Hyposulphite.—9d. per lb.
Lithopone, 30%.—£22 10s. per ton.
Mineral Rubber "Rubpron."—£16 to £18 per ton f.o.r. London.
Sulphur.—£10 to £12 per ton, according to quality.
Sulphur Chloride.—4d. per lb., carboys extra.
Sulphur Precip. B.P.—£56 to £65 per ton.

Thiocarbanilide.—2s. 6d. per lb.
Vermilion, Pale or Deep.—5s. 6d. per lb. Dearer.
Zinc Sulphide.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

Acid, Acetic 80% B.P.—£41 per ton ex wharf London in glass containers.
Acid, Acetyl Salicylic.—2s. 8d. to 2s. 9d. per lb., according to quantity. Ample supplies and keen competition.
Acid, Benzoic B.P.—2s. to 2s. 3d. per lb., according to quantity.
Acid, Boric B.P.—Prices reduced by £5 per ton. Crystal £46 per ton, Powder £50 per ton. Carriage paid any station in Great Britain.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 5d. per lb., less 5% for ton lots. Slightly upward tendency.
Acid, Gallic.—2s. 9d. per lb. for pure crystal, in cwt. lots. Easier.
Acid, Pyrogallic, Crystals.—6s. per lb. for 1 cwt. lots. 7s. 6d. per lb. for 7-lb. lots, according to quantity. Steady market.
Acid, Salicylic.—1s. 3d. to 1s. 6d. per lb., according to quantity. Supplies exceed demand.
Acid, Tannic B.P.—2s. 9d. per lb. Quiet steady demand.
Acid, Tartaric.—1s. 1d. per lb., less 5%. Very firm. Demand good.
Amidol.—9s. per lb., d/d.
Acetanilide.—1s. 7d. per lb. for quantities.
Amidopyrin.—13s. 9d. per lb.
Ammonium Benzoate.—3s. to 3s. 6d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
Atropine Sulphate.—12s. 6d. per oz. for English make.
Barbitone.—11s. 6d. per lb. Price lower owing to competition.
Benzonaphthol.—3s. 6d. per lb. spot. Weaker.
Bismuth Salts.—Prices reduced by about 1s. 3d. to 2s. 3d. per lb. on account of the fall in the price of the metal.
Bismuth Carbonate.—10s. 6d. to 12s. 6d. per lb.
Bismuth Citrage.—10s. 3d. to 12s. 3d. per lb.
Bismuth Salicylate.—9s. to 11s. per lb.
Bismuth Subnitrate.—8s. 8d. to 10s. 8d. per lb. according to quantity.
The price of Bismuth Metal has been raised from 5s. to 7s. 6d. per lb. Bismuth Salts have been advanced accordingly.
Borax B.P.—Crystal £29, Powder £30 per ton. Carriage paid any station in Great Britain.
Bromides.—Potassium, 2s. 1d. to 2s. 3d. per lb.; sodium, 2s. 2d. to 2s. 4d. per lb.; ammonium, 2s. 6d nto 2s. 8d. per lb., all spot. Market very firm. Prices again advanced.
Calcium Lactate.—1s. 6½d. to 1s. 8d., according to quantity. Fair demand and steady market.
Chloral Hydrate.—3s. 8d. per lb., duty paid.
Chloroform.—2s. 6d. per lb. for cwt. lots.
Creosote Carbonate.—6s. 9d. per lb. Little demand.
Formaldehyde.—£39 10s. per ton, in barrels ex wharf.
Glycerophosphates.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 60%, 2s. 6d. per lb.
Guaiacol Carbonate.—7s. 6d. per lb.
Hexamine.—2s. 4d. per lb. for cwt. lots.
Homatropine Hydrobromide.—25s. to 30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 8d. per gallon f.o.r. makers' works, naked.
Hydroquinone.—4s. 3d. per lb. Nominal.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate B.P.—1s. 11d. to 2s. 3d. per lb.
Magnesium Carbonate.—Light Commercial, reduced to £34 per ton net. Light pure, £46 per ton.
Magnesium Oxide.—Light Commercial, £70 per ton, less 2½%, price reduced; Heavy Commercial, reduced to £24 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
Menthol.—A.B.R. recrystallised B.P., 44s. per lb.; April delivery. Synthetic, 22s. 6d. to 27s. 6d. per lb., according to quality. English make. Market rather easier.
Mercurials.—Market flat. Mercury slightly firmer. Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 7d. to 3s. 9d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 3s. 10d. to 4s. per lb.
Methyl Salicylate.—1s. 6d. to 1s. 8d. per lb., for ton lots.
Methyl Sulphonal.—18s. 6d. per lb. Cheaper.
Metol.—11s. per lb. British make.
Morphone and Salts.—Reduced by 1s. to 1s. 3d. per oz.
Paraformaldehyde.—2s. 2d. for B.P. quality. Keen competition has brought prices down.
Paraldehyde.—1s. 2d. to 1s. 4½d. per lb., in free bottles and cases.
Phenacetin.—4s. 5d. per lb. in cwt. lots. Unsettled. Supplies exceed demand.
Phenazone.—6s. 3d. to 6s. 6d. per lb. Spot price lower than forward.
Phenolphthalein.—4s. 3d. to 4s. 6d. per lb. for cwt. lots.
Potassium Bitartrate 99/100% (Cream of Tartar).—83s. per cwt., less 2½% for ton lots.
Potassium Citrate.—1s. 10d. to 2s. 2d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb. Quiet.
Potassium Iodide.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.
Potassium Metabisulphite.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 7½d. per lb., spot; commercial, 8d. to 8½d. per lb., carriage paid. Slight reaction after recent advance.
Quinine Sulphate.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
Resorcin.—4s. 6d. per lb. In fair quantities.
Saccharin.—63s. per lb. in 50 lb. lots.
Salol.—3s. 6d. per lb., for cwt. lots. Slightly dearer.
Silver Proteinate.—12s. per lb. for satisfactory product light in colour.
Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb. From natural benzoic acid. Supplies of good quality available.
Sodium Citrate, B.P.C., 1923.—1s. 11d. to 2s. 2d. per lb., according to quantity.
Sodium Hyposulphite, Photographic.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
Sodium Metabisulphite Crystals.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—75s. per cwt., for ton lots and upwards.
Sodium Salicylate.—Powder, 2s. 2d. to 2s. 3d. per lb. Crystal, 2s. 3d. to 2s. 4d. per lb. Flake, 2s. 3d. to 2s. 6d. per lb. Strong demand, market firm.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. per ton, minimum 5 ton lots, according to quantity; 1-cwt. kegs included.
Sulphonal.—13s. per lb. accepted for quantity.
Thymol.—16s. per lb.

Perfumery Chemicals

Acetophenone.—9s. 6d. per lb.
Aubepine.—11s. 3d. per lb.
Amyl Acetate.—3s. per lb.
Amyl Butyrate.—6s. 6d. per lb.
Amyl Salicylate.—3s. 1½d. per lb.
Anethol (M.P. 21/22° C.).—4s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s. 7½d. per lb.
Benzyl Alcohol free from Chlorine.—2s. 7½d. per lb.
Benzaldehyde free from Chlorine.—3s. per lb.
Benzyl Benzoate.—3s. per lb.
Cinnamic Aldehyde Natural.—14s. 9d. per lb.
Coumarin.—14s. 9d. per lb.
Citronellol.—22s. per lb.
Citral.—9s. per lb.
Ethyl Cinnamate.—10s. per lb.
Ethyl Phthalate.—3s. per lb.
Eugenol.—10s. per lb.
Geraniol (Palmarosa).—28s. 6d. per lb.
Geraniol.—9s. 6d. to 18s. 6d. per lb.
Heliotropine.—6s. 3d. per lb.
Iso Eugenol.—15s. per lb.
Linalol ex Bois de Rose.—24s. 6d. per lb.
Linalyl Acetate.—24s. 6d. per lb.
Methyl Anthranilate.—10s. per lb.
Methyl Benzoate.—5s. per lb.
Musk Ambrette.—50s. per lb.
Musk Ketone.—37s. 6d. per lb.
Musk Xylol.—10s. 3d. per lb.
Nerolin.—4s. 6d. per lb.
Phenyl Ethyl Acetate.—15s. per lb.
Phenyl Ethyl Alcohol.—14s. per lb.
Rhodinol.—38s. 6d. per lb.
Safrol.—1s. 8d. per lb.
Terpineol.—1s. 10d. per lb.
Vanillin.—25s. to 25s. 6d. per lb.

Essential Oils

Almond Oil, Foreign S.P.A.—13s. 3d. per lb. Cheaper.
Anise Oil.—2s. 7½d. per lb.
Bergamot Oil.—16s. per lb.
Bourbon Geranium Oil.—20s. per lb. Cheaper.
Camphor Oil.—60s. per cwt.
Cananga Oil, Java.—10s. 9d. per lb.
Cinnamon Oil, Leaf.—6d. per oz.
Cassia Oil, 80/85%.—9s. 3d. per lb.
Citronella Oil.—Java, 85/90%, 4s. 9d. per lb. Ceylon, 3s. to 3s. 2d. per lb., according to quality. Firmer with higher prices for forward delivery.
Clove Oil.—7s. 6d. per lb.
Eucalyptus Oil, 70/75%.—2s. per lb.
Lavender Oil.—French 38/40% Esters, 31s. 6d. per lb. Cheaper.
Lemon Oil.—3s. 6d. per lb. Advanced.
Lemongrass Oil.—5s. 9d. per lb.
Orange Oil, Sweet.—10s. 9d. per lb.
Palma Rose Oil.—15s. 3d. per lb.
Otto of Rose Oil.—Bulgarian, 42s. 6d. per oz. Anatolian, 28s. per oz.
Palma Rosa Oil.—16s. 9d. per lb.
Peppermint Oil.—Wayne County, 60s. per lb. Cheaper. Japanese, 15s. 9d. per lb. Cheaper.
Petitgrain Oil.—9s. 9d. per lb.
Sandal Wood Oil.—Mysore, 26s. 7d. per lb. Australian, 18s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, June 5, 1925.

BUSINESS in heavy chemicals has been rather restricted during the latter half of the past week owing to holidays. There has been moderate inquiry for export. Prices both for Home and Continental products remain practically unchanged.

Industrial Chemicals

ACID ACETIC.—In moderate demand, and prices unchanged. 98/100% glacial, £56 to £67 per ton according to quality and packing, c.i.f. U.K. ports. 80% pure, £40 to £42 per ton. 80% technical, £39 to £41 per ton, packed in casks, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flaked, £40 per ton. Powdered, £42 per ton, packed in bags, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, ICE CRYSTALS.—Unchanged at about 4½d. per lb. delivered, but could probably be obtained for less.

ACID CITRIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex store. Offered for early shipment at a fraction less.

ACID FORMIC 85%.—Offered from the continent at about £48 10s. per ton, c.i.f. U.K. ports. Spot material quoted £49 10s. per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand quoted £23 15s. per ton, ex station full truck loads.

ACID OXALIC, 98/100%.—Now offered from the continent at about 3½d. per lb., c.i.f. U.K. ports. Spot material quoted 3¾d. per lb., ex wharf. In little demand.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Rather better inquiry and prices unchanged at about 1s. per lb., less 5%, ex store. Offered for early shipment at a fraction less.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £6 15s. per ton, ex store. Spot delivery. Offered for prompt shipment from the continent at about £6 5s. per ton, c.i.f. U.K. ports.

ALUM, LUMP POTASH.—Quoted £8 per ton, c.i.f. U.K. ports, prompt shipment from the continent. Powdered quality, 5s. per ton less. Spot lots quoted £9 5s. per ton, ex store.

AMMONIA ANHYDROUS.—Unchanged at 1s. 4½d. per lb., ex station, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton. Powdered, £39 per ton. Packed in 5 cwt. casks, delivered U.K. ports.

AMMONIA LIQUID, 880°.—In steady demand. Unchanged at 2½d. to 3d. per lb. delivered, according to quantities.

AMMONIA MURIATE.—Grey galvaniser's crystals of English manufacture quoted £28 10s. per ton, ex station. Offered from the continent at about £24 10s. per ton, c.i.f. U.K. ports. Fine white crystals on offer at £19 15s. per ton, c.i.f. U.K. ports.

ARSENIC.—Refined white Cornish quoted £26 per ton, ex store, spot delivery. Offered for prompt despatch from works at about £25 per ton, ex wharf. Foreign arsenic now on offer at about £23 per ton, c.i.f. U.K. ports.

BARIUM CARBONATE, 98/100%.—Still lower quotations from the continent now quoted £7 10s. per ton, c.i.f. U.K. ports.

BARIUM, CHLORIDE.—In little demand and price unchanged at about £10 5s. per ton, ex store for English material. Offered from the continent at about £8 10s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots quoted £10 10s. per ton, ex station. Contracts 20s. per ton less.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £24 10s. per ton; crystals, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations, minimum ton lots.

CALCIUM CHLORIDE.—English price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. stations. Continental lower at about £3 10s. per ton, c.i.f. U.K. ports, minimum 50 ton lots.

COPPERAS, GREEN.—Unchanged at about £3 5s. per ton, ex works, packed in casks free.

COPPER SULPHATE.—Quoted £24 10s. per ton, f.o.b. U.K. ports for export. Continental available at about £23 per ton, ex store.

FORMALDEHYDE 40%.—Spot material unchanged at about £40 per ton, ex store. Offered for early shipment at £39 per ton, c.i.f. U.K. ports.

GLAUBER SALTS.—Fine white crystals of English manufacture quoted £4 per ton, ex store or station. Continental material on offer at about £3 per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material unchanged at about £42 to £42 10s. per ton, ex store. Offered from the continent at about £39 10s. per ton, c.i.f. U.K. ports.

LEAD, WHITE.—Quoted £43 per ton, ex store, spot delivery.

LEAD ACETATE.—White crystals offered from the continent at £43 10s. per ton, c.i.f. U.K. ports, prompt shipment. Brown quality quoted £37 per ton, c.i.f. U.K. ports. White crystals offered for spot delivery at £44 10s. per ton, ex store.

LEAD NITRATE.—Quoted £42 to £42 10s. per ton, ex station. Offered from the continent at about the same price.

MAGNESITE, GROUND CALCINED.—Usual steady demand and prices unchanged at about £8 per ton, ex station.

MAGNESIUM CHLORIDE.—Rather higher quotations from the continent. Now quoted £3 2s. 6d. per ton, c.i.f. U.K. ports. Some spot material available at about £3 10s. per ton, ex store.

POTASH CAUSTIC.—88/92%. Unchanged at about £29 per ton, ex wharf, prompt shipment from the continent. Spot material available at about £30 10s. per ton, ex store.

POTASSIUM BICHROMATE.—Prices for home consumption 5d. per lb. delivered.

POTASSIUM CARBONATE.—96/98%. Unchanged at about £25 10s. per ton, c.i.f. U.K. ports. Spot material quoted £26 per ton, ex store. 90/94% quality quoted £23 10s. per ton, c.i.f. U.K. ports. 80/85% hydrated quality quoted £21 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—Still scarce. Spot material quoted 4d. per lb., ex store. Limited quantity available for prompt shipment from the continent at about 3¾d. per lb., c.i.f. U.K. ports.

POTASSIUM NITRATE, SALTPETRE.—Refined granulated 99% quoted at about £28 per ton, ex store. Quoted £24 10s. per ton, c.i.f. U.K. ports, for prompt shipment from the continent.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—On offer at 7½d. per lb., ex store. Offered for prompt shipment from the continent at about 7¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—Quoted 7¼d. per lb., ex store, but could probably be obtained for less.

SODA CAUSTIC.—76/77%, £18 per ton; 70/72%, £16 12s. 6d. per ton. Broken, 60%, £17 2s. 6d. per ton. Powdered, 98/99%, £21 7s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Spot material quoted £21 per ton, ex store. Offered for prompt shipment from the continent at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkali, 58%, £8 13s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Commercial quality offered from the continent at £8 5s. per ton, c.i.f. U.K. ports. English material unchanged at £9 10s. per ton, ex station. Pea crystals, £14 per ton, ex station.

SODIUM NITRATE.—Ordinary quality quoted £13 7s. 6d. per ton, ex store; 96/98% refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE 100%.—Offered from the continent at about £22 per ton, c.i.f. U.K. ports. Spot material quoted £24 10s. per ton, ex store.

SODIUM PRUSSIATE, YELLOW.—In moderate demand and price unchanged at about 4d. per lb., ex store.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption £3 10s. per ton, f.o.r. works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—English manufacturers quote: 60/62% solid, £15 per ton; broken, £1 per ton more; flake, £2 per ton more; crystal, 31/34%, £9 5s. per ton, carriage paid U.K. stations, minimum four ton lots, with slight reduction for contracts over a period; 60/62% solid offered from the continent at about £10 15s. per ton, c.i.f. U.K. ports; broken, £1 per ton more; 30/32% crystals, £8 5s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £9 10s. per ton; roll, £8 10s. per ton; rock, £8 7s. 6d. per ton; roll, £8 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—97/98% of continental manufacture quoted £23 per ton, c.i.f. U.K. ports. English material for export on offer at about £25 to £26 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Commercial crystals on offer from the continent at about £12 per ton, c.i.f. U.K. ports.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Company News

SAN SEBASTIAN NITRATE CO.—A dividend of 5 per cent. is announced for the year 1924.

SHELL TRANSPORT AND TRADING CO.—A final dividend is recommended on the ordinary shares of 2s. 6d. per share, making 22½ per cent., free of tax, for 1924.

NEW PACCHA AND JAZAMPA NITRATE CO.—The profit for the year 1924 amounted to £10,473. A dividend of 6 per cent., less tax, is recommended, carrying forward £5,208.

UNITED PREMIER OIL AND CAKE COMPANY.—The directors recommend a dividend of 6 per cent., subject to tax, for the year on the ordinary shares. Last year 5 per cent. was paid.

LAUTARO NITRATE CO., LTD.—The shareholders on Tuesday confirmed a resolution authorising an increase in the capital to £6,560,000 by the creation of 512,000 ordinary shares of £5 each.

WALL PAPER MANUFACTURERS, LTD.—The directors have decided to pay an interim dividend of 4 per cent. in respect of the current financial year on the ordinary shares of the company.

ESPERANZA COPPER AND SULPHUR.—The profit for the year 1924 was £18,972 and £7,533 was brought forward, making £26,505. The directors propose to pay on June 30 next a dividend of 1s. 6d. per share, less tax, at 4s. 6d. per £, to holders registered on June 10, leaving to be carried forward £7,755.

IDRIS HYDRAULIC TIN.—For the year 1924 the profit amounted to £23,195, to which has to be added £12,638 brought in. Dividends of 6d. per share were paid in April, July and October, 1924. A dividend of 1s. per share was paid in February last, and the directors recommend that the remaining balance of £9,777 be carried forward.

TARAPACA AND TOCOPILLA NITRATE CO.—Trading during the year 1924 resulted in a net profit of £41,599, comparing with £43,634 for the preceding year. Dividend is to be reduced from 12½ per cent. to 10 per cent., while no allocation to reserve is made this year, against £30,000 last year. The balance carried forward is raised from £29,879 to £40,478.

YORKSHIRE DYEWARE AND CHEMICAL CO.—After providing for depreciation, &c., the surplus for the year ended March 31 last amounted to £24,006, and a balance brought forward of £7,421 makes a total of £31,427. A final dividend at the rate of 12½ per cent. is proposed on the ordinary shares, making 15 per cent., less tax, for the year, leaving to be carried forward a balance of £24,545. A similar dividend was paid a year ago.

BURMAH OIL COMPANY.—The report for the year 1924 shows that after charging income tax, etc., and writing off £378,981 for depreciation, the profit is £2,257,158, against £2,203,896 a year ago after writing off £333,237 for depreciation. A final dividend of 4s. 6d. per share, less tax, is proposed on the ordinary shares, making 7s. for the year, equivalent to 35 per cent., less tax, and comparing with 30 per cent. for the preceding year, when the distribution was made tax free.

NEUCHATEL ASPHALTE CO.—After providing for depreciation and for reserves for maintenance the profit for the year 1924 amounted to £61,124 to which has to be added £11,259 brought forward, making a total of £72,383. Preference dividends for the year, amounting to £10,000, were paid, leaving a balance of £62,383. The directors recommend a dividend of 1s. 3d. per ordinary share, less tax, for the year, payable on June 18, leaving £36,140 to be carried forward.

SCOTTISH OILS COMPANY.—The net profits for the year ended March 31 were £172,195, and £23,148 was brought forward. A final dividend of 3½ per cent. is proposed on the preference shares, making 7½ per cent. for the twelve months, and carrying forward £34,382. The company's net earnings for 1923–24 were £72,063, and only 3½ per cent. was paid on the preference shares. For 1922–23 net profits were £168,761, for 1921–22 £160,869, and for 1920–21 £138,782, and the full dividends were paid on the 7 per cent. preference shares.

J. C. AND J. FIELD.—The annual report for the period to March 31 last, states that the profit and loss account shows that, after providing for repairs and depreciation, there is credit of £32,053. Deducting income tax and corporation profits tax, directors' and auditors' fees, legal charges and expenses of secretary's department, there remains £20,224, to which has to be added £5,589 brought in, making £25,813. The board recommends a dividend of 12½ per cent. on the paid-up capital of the ordinary shares, less tax; placing to reserve fund £6,000, making total of £30,000, and carrying forward £6,876.

BOOTS PURE DRUG CO.—The net profit for the year ended March 31 last was £654,837. Dividends on the ordinary shares for the year have been paid amounting to 36 per cent., less tax, requiring £360,000, leaving a balance of undivided profit of £198,087, and £210,552 was brought in. It is proposed to increase the reserve fund to £750,000 by the allocation of £246,011; £10,000 is placed to freehold reserve fund, and £152,629 carried forward. The net profit for the preceding year was £628,620, and dividends totalling 36 per cent. were paid on the ordinary shares and £100,000 transferred to reserve.

VICKERS AND INTERNATIONAL COMBUSTION ENGINEERING, LTD., announce that the name of the company has been changed to "International Combustion, Ltd." The nominal capital is being increased from £500,000 to £1,200,000. Sir Trevor Dawson, who was chairman, while retaining his interest, has found that its expanding business necessitated more time than he was able to devote to it, and has asked to be relieved of his position. The directors have therefore appointed in his place Mr. G. R. T. Taylor, who is also the managing director of the company and the chairman and managing director of Taylor Brothers and Co., Ltd., and a director of the London Midland and Scottish Railway. Mr. George C. Usher, the general manager of the company, and Mr. S. McEwen have been elected directors, and the board now consists of G. R. T. Taylor, G. E. Learnard, U.S.A., W. R. Wood, U.S.A., B. H. Binder, Noel H. Docker, George C. Usher and S. McEwen. The offices of the company remain at Africa House, Kingsway, London, W.C.2, the manufacture of the company's products being carried out at the works at Barrow-in-Furness, which are leased by special arrangement from Vickers, Ltd. The telegraphic address has been changed from "Vickomb" to "Lopulco."

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to June 20, 1925.

"REEITE."

455,841. For compounds for water-softening purposes. Tinkers, Ltd., Daisyfield Boiler Works, Ashton Road, Newton, Hyde, near Manchester; boiler makers and engineers. January 30, 1925.

"OBLITO."

457,725. For varnishes, paints, enamels, dry colours, japans and anti-corrosive oils. Class 1. Pinchin, Johnson and Co., Ltd., General Buildings, Aldwych, London, W.C.2; varnish, colour and paint manufacturers. April 1, 1925. (To be Associated. Sect. 24.)

458,183. For chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Class 1. The Mond Tar By-Products Syndicate, Ltd., 47, Victoria Street, London, S.W.1., manufacturers. April 18, 1925.

Opposition to the Registration of the following Trade Marks can be lodged up till July 3, 1925.

"THARCO."

455,262. For chemical substances used in manufactures, photography or philosophical research and anti-corrosives. Class 1. The Armstrong Co. (a corporation organised and existing under the laws of the State of Michigan, United States of America), corner of Post Avenue and South Street, Detroit, State of Michigan, United States of America; manufacturers. January 12, 1925. (To be Associated. Sect. 24.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry make no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BAILEY, Richard Douglas, 20, Church Road, Seaforth, analytical chemist. (C.C., 6/6/25.) £14 6s. 6d. April 29.

RICHARDSON BROS., Shorey Bank, Darwen, polish manufacturers. (C.C., 6/6/25.) £17 7s. 5d. April 27.

HOBDEY, Mr E. E., 29, Kingsleys Avenue, Whitley Bay, paint manufacturer. (C.C., 6/6/25.) £26 10s. 8d. April 30.

Receivership

CHEMICAL INDUSTRIES, LTD. (R., 6/6/25.) R. A. Witty, of 6, Dowgate Hill, E.C. was appointed receiver and manager by Order of Court dated January 24, 1924. (Notice filed May 18, 1925.)

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

PHARMACOPŒIAN FORMULÆ, LTD., London, W. (M., 6/6/25.) Registered May 19, £500 debenture, to S. J. Barlow, Fairhaven, Dinerth Road, Colwyn Bay; general charge. *Nil. March 5, 1925.

PHŒNIX BLEACHING AND DYEING CO., LTD., Pendleton. (M., 6/6/25.) Registered May 22, £12,000 debentures, to R. C. West, Oakenhurst, Harrop Road, Hale, bleacher; general charge (excluding uncalled capital and certain specified moneys). *Nil. December 31, 1924.

London Gazette

Companies Winding Up Voluntarily

AYRE (JAMES) AND SONS, LTD. (C.W.U.V., 6/6/25.) G. S. Phillips, 11-12, Skinner Street, Newport, Mon., appointed liquidator, May 23.

BIRKETT AND CO., LTD. (C.W.U.V., 6/6/25.) A. T. Winter, 7, Bridgegate, Retford, Accountant, appointed liquidator, May 19.

MOORHEAD AND PARTNERS, LTD. (C.W.U.V., 6/6/25.) J. Lawrence Goodwin, J. P. W. Goodwin and Son, Chancery Lane Station Chambers, London, W.C.1, Chartered Accountants, appointed liquidator, May 22.

WILLIAMS CHEMISTS, LTD. (C.W.U.V., 6/6/25.) T. G. Vice, Chartered Accountant, Temple Buildings, Bowlalley Lane, Hull, appointed liquidator, May 26. Meeting of creditors at the offices of the liquidator on Wednesday, June 10, at 12 noon. Creditors claims by June 30.

New Companies Registered

COMMERCIAL ALCOHOL CO., LTD., 7, Princes Street, Westminster, London, S.W.1. To acquire any invention relating to alcohol; sugar manufacturers, producers, refiners, etc. Nominal capital, £30,000 in £1 shares.

'JOBRO," LTD. To carry on the business of agents for and dealers in chemicals, drugs, dyes and dyestuffs, oils and oleaginous and saponaceous substances, etc. Nominal capital, £100 in 1s. shares. Solicitor: C. R. Hardman, 2, Blue Boar Court, Manchester.

MILLS PACKARD CONSTRUCTION CO., LTD., 32, Duke Street, Ipswich. To construct, manage or control chemical plant, machinery and conveniences of all kinds used in connection with chemical products and processes. Nominal capital, £1,000 in £1 shares.

H. W. D. WARD, LTD., Chemical Works, Watling Street, Fenny Stratford, Bletchley, Bucks. Chemical and colour manufacturers, etc. Nominal capital, £3,000 in £1 shares (1,000 8 per cent. cumulative preference and 2,000 ordinary).

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS FOR POLAND.—A well-established importer invites representation for chemicals and fats, particularly tallow and fats for soap manufacture.—P. Rajner, Sluzewska No. 4, Warsaw, Poland.

OILS.—A commission agent in Copenhagen desires to be placed in touch with British exporters of oils and other raw materials for the margarine industry. (Reference No. .)

WHITE LEAD, ETC.—The directors of the Madras and Southern Mahratta Railway Co., Ltd., 25, Buckingham Palace Road, London, S.W.1, invite tenders for 2¾ tons white lead (dry) and 23 tons white lead (ground in oil). Tenders are due on June 16, 1925, by 2 p.m. Tender forms from above address (one guinea), which is not returnable. The directors do not bind themselves to accept the lowest or any tender.

CHEMICALS FOR PAPER TRADE.—A commission agent in Gothenburg desires to represent British exporters of chemicals and raw materials used in paper and pulp mills. (Reference No. 686.)

SALT CAKE, ALUMINOFERRIC, AND SULPHUR.—A firm of commission agents in Oslo desires to represent British manufacturers of salt cake for the cellulose industry, aluminferric for the paper-making industry, and also exporters of sulphur. (Reference No. 680.)

CENTRIFUGAL PUMPS.—The Department of Sanitary Works of the Nation are calling for tenders for the supply of two sets of centrifugal pumps, driven by internal combustion engines, for the water supply of Rio Gallegos (Santa Cruz). Tenders to be presented in Buenos Aires by July 23. British firms desirous of examining the specification, etc., should advise the D.O.T. without delay, when the Commercial Secretary will be requested to send the necessary documents, the expense incurred to be shared equally by the applicants. (Reference No. A2073.)

LUBRICATING OILS.—A commission agent of Valparaiso, Chile, is desirous of securing the representation of a British firm exporting lubricating oils, including cylinder, machine and automobile oils. (Reference No. 693.)

Tariff Changes

AUSTRALIA.—The operation of the deferred duties on citric acid has been postponed until October 1, 1925.

BASUTOLAND, BECHUANALAND AND SWAZILAND.—These provinces have imposed a dumping duty on asbestos-cement sheets imported from Germany.

COSTA RICA.—Duty-free import is now granted to petroleum gasoline, coal and lubricating oil for use in navigation—subject to authority.

ITALY.—A decree allows the temporary duty-free admission in quantities of no less than 100 kilogs, of genuine crude olive oil to be refined and re-exported.

TUNIS.—A decree temporarily suspends the export duty of 10 per cent. *ad valorem* on margarine, oleo-margarine, edible fats, and similar substances.

The Faraday Celebrations

IT may be of interest to state that the banquet to be given at the Goldsmiths Hall, London, on Tuesday evening, June 16, in connection with the centenary of Faraday's discovery of benzene will be open to ladies. Tickets (two guineas each) may still be obtained from the Secretary of the Royal Institution.